United States Patent [19]

Brown

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[45] **Apr. 17, 1973**

[54] **FURNITURE TRUCK FRAME**

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[52] **U.S. Cl.**.....**269/17,** 280/42.24

[51] **Int. Cl.**.....**B23q 37/00,** B23q 3/18, B25h 5/00

[58] **Field of Search**.....214/1 D; 269/17; 29/91.7, 91.8; 280/43.18, 43.24, 34, 35, 47.35

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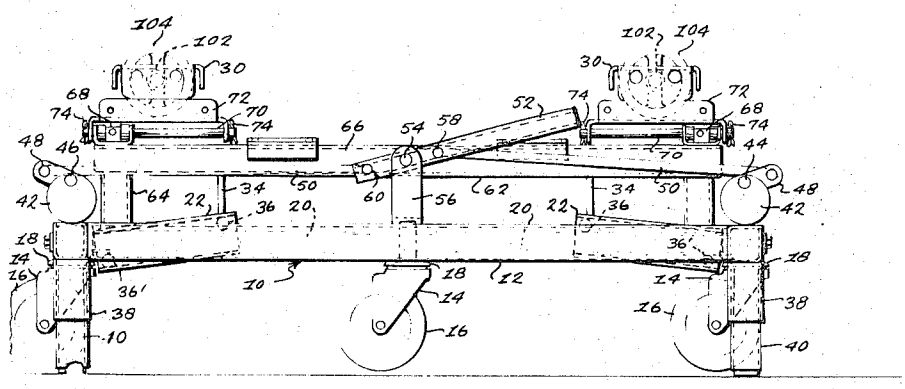
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[57] **ABSTRACT**

A truck for supporting furniture frames or the like comprising a wheeled base structure and a pair of laterally movable supporting elements each of which is mounted on the base structure by two support arms fixed separately to sleeve elements carried exteriorly on longitudinally extending base elements, each support arm extending beyond one end of the sleeve element to which it is fixed and each sleeve element being carried on its base element by longitudinally spaced rollers disposed respectively to ride the upper and lower surfaces of the base element with the roller disposed for riding the upper base element surface being located substantially nearer the end of the sleeve element from which the support arm extends. Additionally, the supporting elements may be mounted on the base element for selective vertical movement with respect thereto and a plurality of jacking legs may be mounted on the base structure with an operating arrangement for simultaneously and selectively lowering these legs to extend beneath the truck wheels whereby the truck is supported solely by these legs.

5 Claims, 8 Drawing Figures



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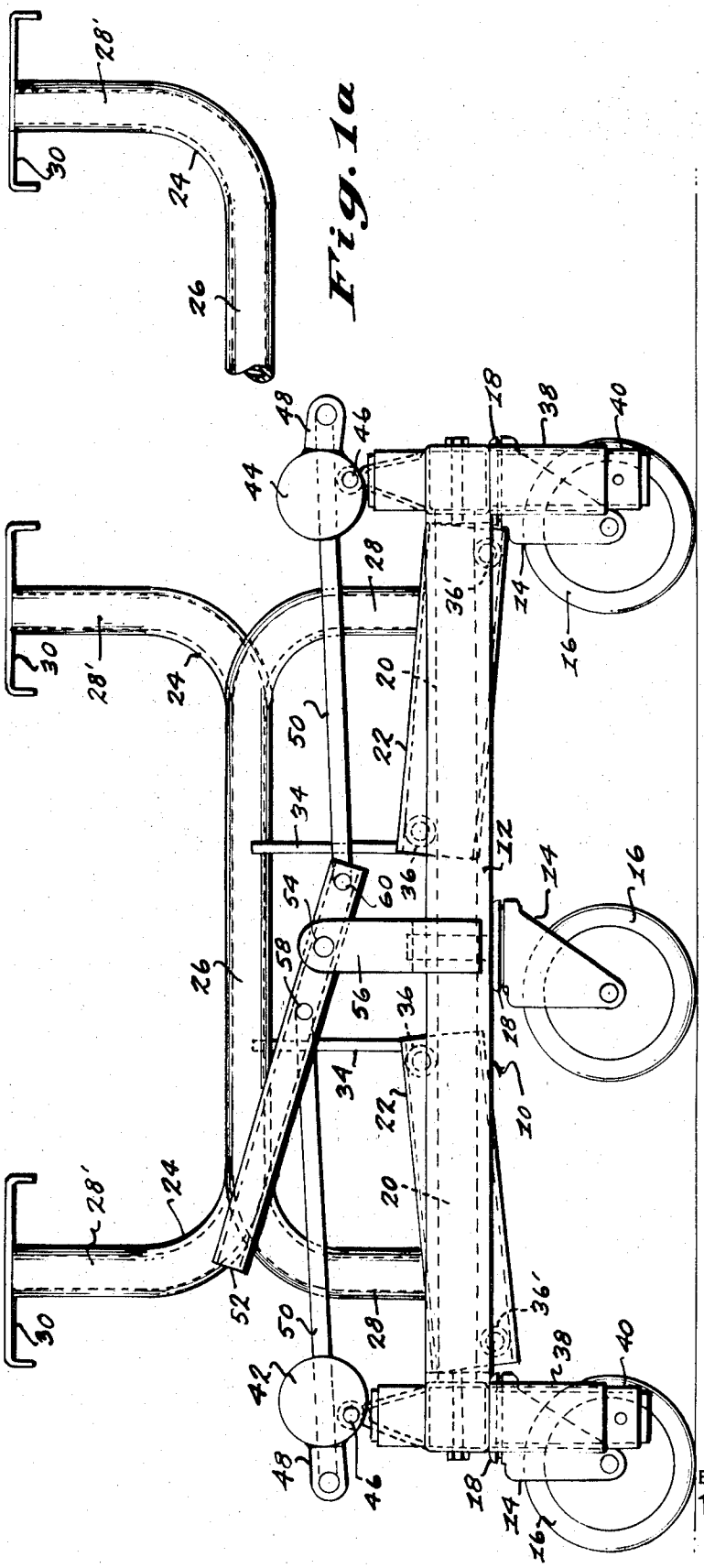


Fig. 1a

Fig. 1

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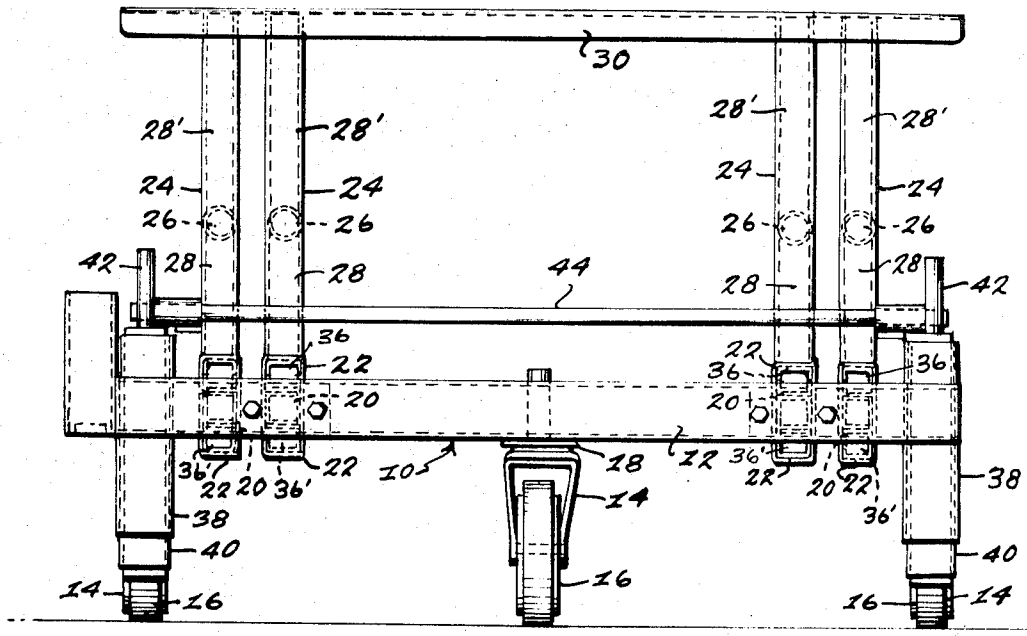
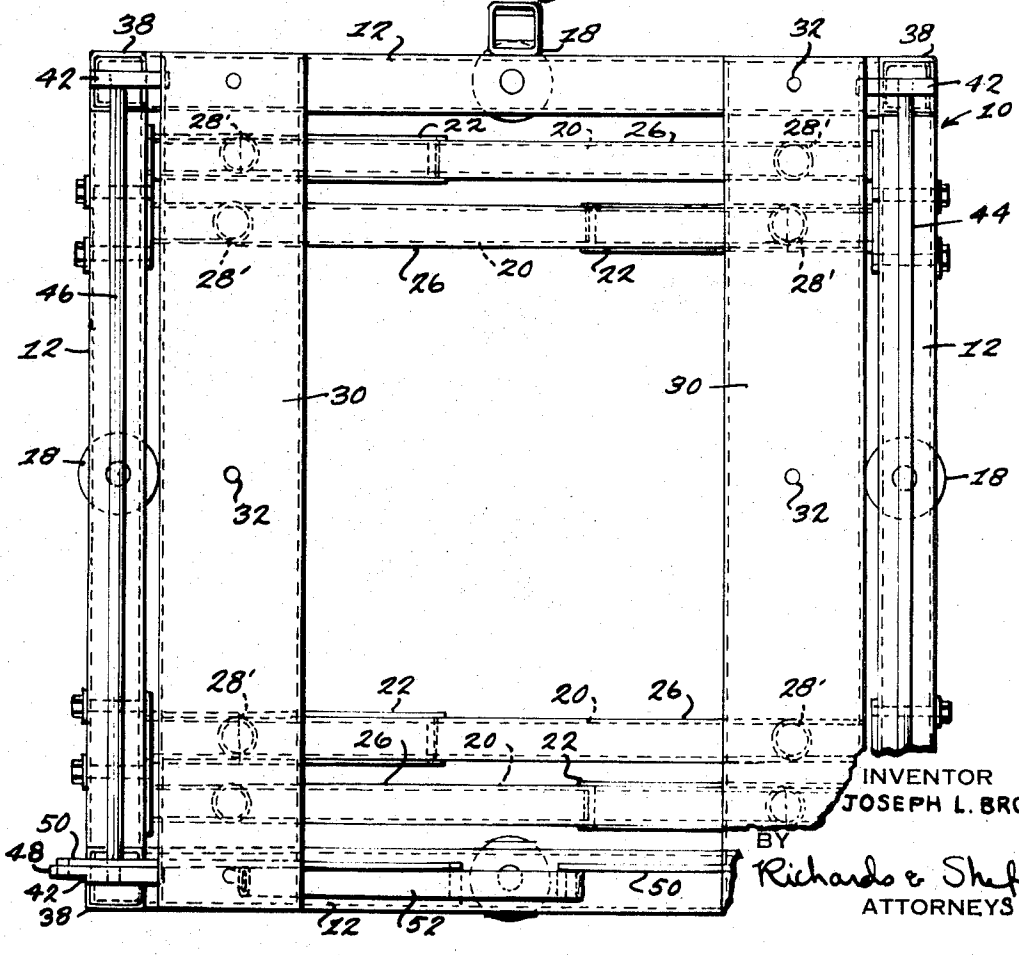


Fig. 2

Fig. 3



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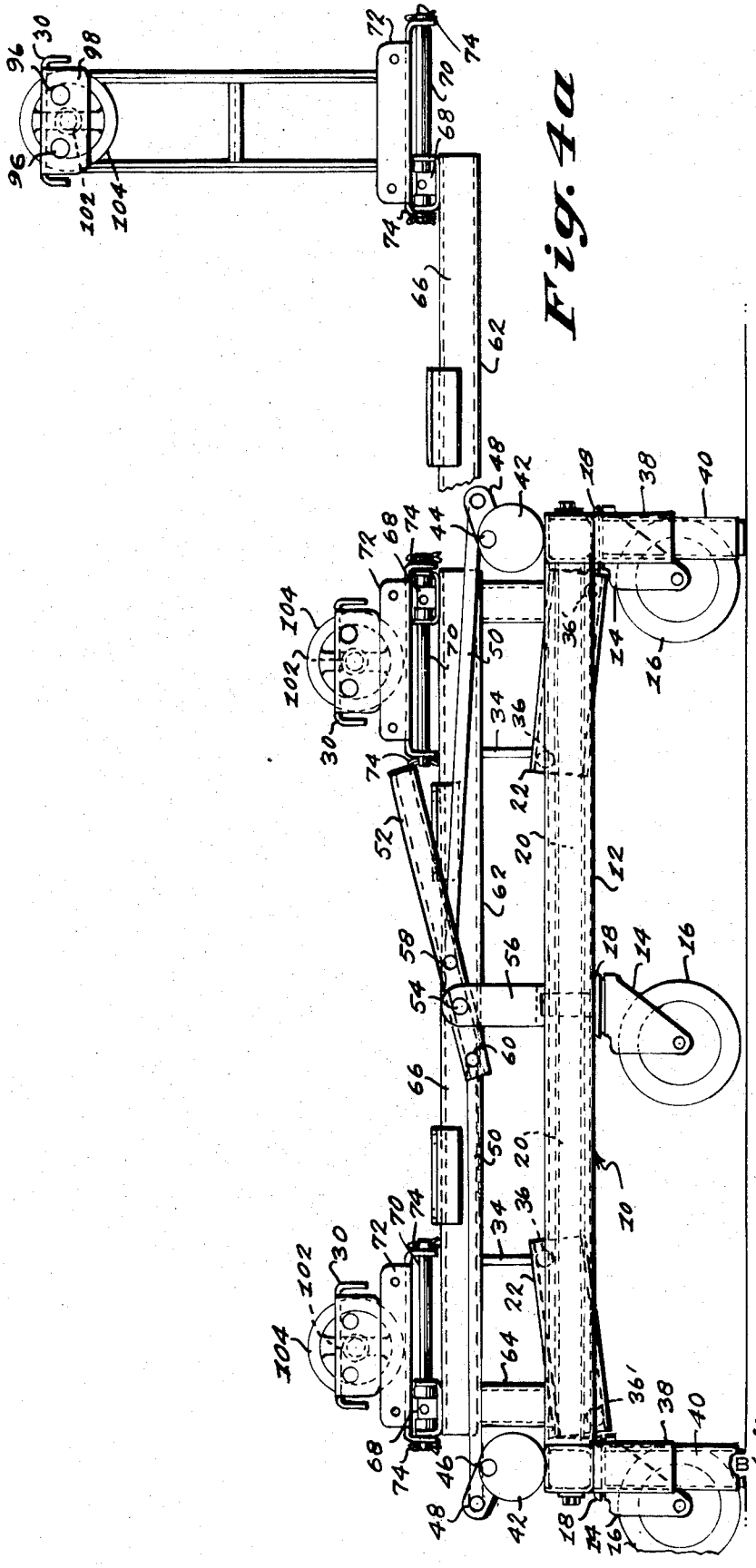


Fig. 4a

Fig. 4

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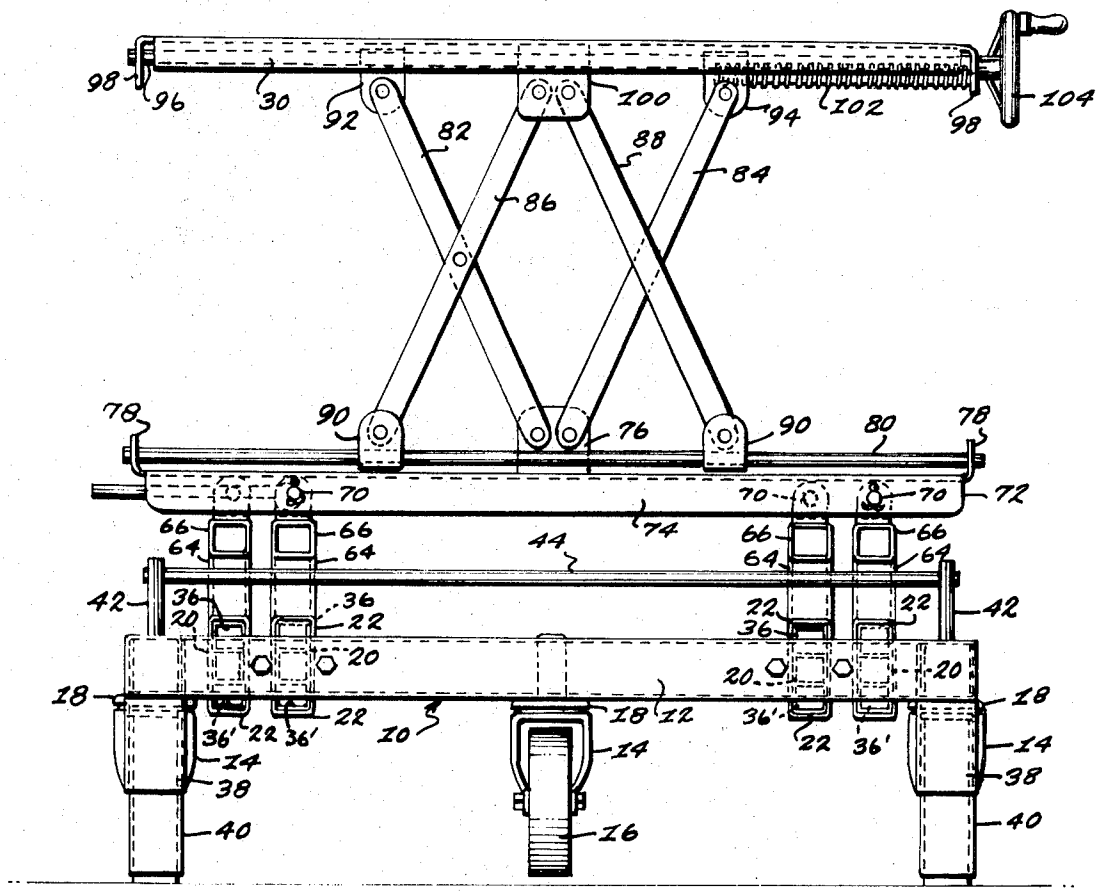


Fig. 5

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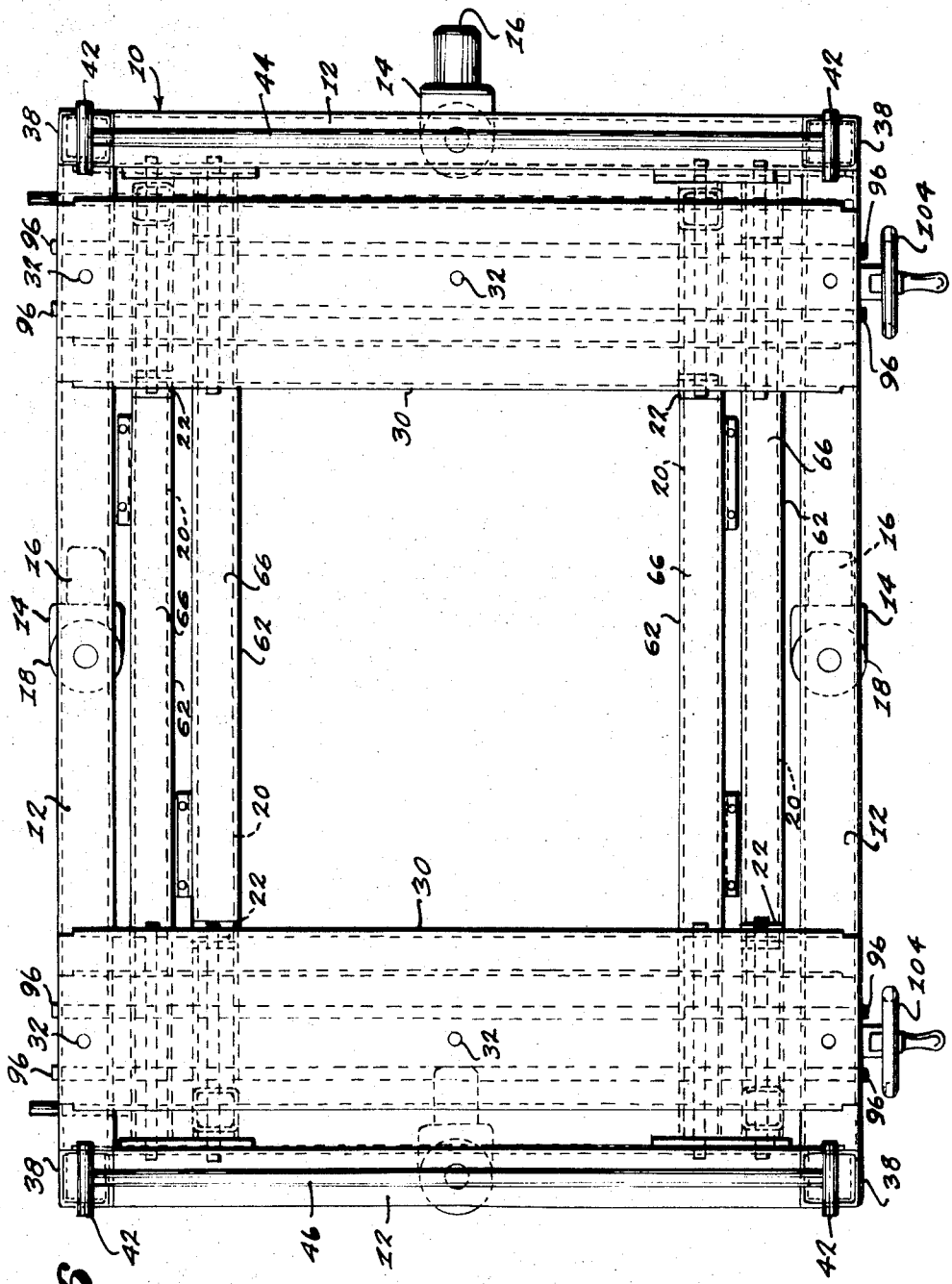


Fig. 6

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FURNITURE TRUCK FRAME

BACKGROUND OF THE INVENTION

In the furniture manufacturing industry, upholstered furniture pieces such as love seats, divans, chairs and the like are generally built up from a wooden frame through as many as 20 different operations such as springing, webbing, upholstering and finishing. Each separate operation is performed at an operating station manned by personnel particularly trained for that operation, and the frame is moved from station to station in sequence until the construction is completed.

Herefore, it has been common practice to move the frame from station to station by sliding it across a floor surface which is purposely maintained in a highly polished condition to facilitate this sliding. In addition to the obvious safety hazard which such a condition presents to personnel walking across this floor, sliding of the frame also results in a considerable amount of costly breakage, particularly to the legs of heavy, expensive pieces of furniture.

Moreover, since the nature of the work done on the frame varies from station to station, the attitude and elevation at which the frame is supported to facilitate this work also varies, and it is now common practice to furnish each operating station with sawbucks, or short bucks, specially selected to accommodate the operation as well as the individual operator at each station.

In an attempt to alleviate some of the difficulties encountered when the aforementioned method was utilized, it has been proposed previously to use a conventional wheeled cart to support a furniture frame and transport it from station to station, but this practice has generally fallen into disuse because the position of the furniture frame on the cart could not be varied to dispose the frame properly for each of the aforementioned different operations performed thereon at the several operating stations, because the wheeled cart could not be completely immobilized to stabilize the furniture frame during the time it was being worked upon, and because the fixed supports on the cart did not have universal application in properly supporting the wide range of furniture frame sizes and shapes which must be dealt with in a typical furniture manufacturing operation.

SUMMARY OF THE INVENTION

The present invention is directed to a unique furniture truck which eliminates the drawbacks associated with the above-described prior art methods of supporting and transporting furniture frames during furniture manufacturing operations.

In the two described embodiments of the present invention, the truck includes a wheeled base structure and a pair of spaced furniture frame supporting elements which are mounted for selective lateral movement with respect to one another to support properly furniture frames of varying sizes and shapes, and the base structure is provided with a plurality of jacking legs arranged for vertical movement and being selectively operable to move simultaneously between an inoperative raised position and an operative lowered position at which the legs depend beneath the base structure wheels to provide a stable and stationary support for the truck and the supported furniture frame. In one of the described embodiments of the present invention, the supporting elements are additionally mounted for selective vertical movement with respect to the base structure so as to permit raising or lowering of the supported furniture frame as needed to provide easy access to the frame by the operator at the various operating stations.

In accordance with one of the features of the present invention each of the furniture frame supporting elements is mounted on the base structure for lateral movement by an arrangement which includes at least one sleeve element carried exteriorly on a laterally extending base element for movement therealong, and which also includes a support arm fixed to this sleeve element and extending longitudinally beyond one end thereof to a connection with one of the supporting elements. The sleeve element is carried on the base element in a unique manner consisting of a pair of longitudinally spaced rollers mounted in the sleeve element to ride the upper and lower surfaces of the base element with the roller disposed for riding the upper base element surface being located substantially nearer the end of the sleeve element from which the support arm extends. Thus, as will be explained in greater detail presently, the sleeve element is easily mounted on the base element without any significant problem of mounting tolerance, and the weight of the furniture frame and the furniture frame supporting elements, concentrated at the extending ends of the support arms, create a force couple acting on the base member at the sleeve element rollers whereby this weight is readily supported by the sleeve element.

In one of the disclosed embodiments of the present invention, the supporting elements are connected to their respective support arms through pantographic linkages arranged to permit the supporting elements to be raised or lowered selectively with respect to their respective support arms as the pantographic linkages are caused to be expanded or contracted by an operating mechanism including a hand wheel, or by a pneumatic, hydraulic or electrically actuated mechanism. Moreover, in this embodiment the lower portion of the respective pantographic linkages are carried by separate bracket members slidably mounted on the extending end portion of the support arms for movement between a first position overlapping this extending end portion and a second position projecting beyond such extending end portion, whereby the lateral spacing between the supporting elements can be additionally increased by moving the bracket members to their second positions.

Preferably, there are four of the aforementioned vertically movable jacking legs spaced around the periphery of the base structure, and these legs are operated selectively and simultaneously by an operating mechanism which includes an eccentric element rotatably mounted adjacent the top of each leg in contact therewith with two shaft members connecting these eccentric elements in pairs, and includes an operating lever acting to turn one eccentric element in each pair to lower thereby the four leg members simultaneously to a position at which the furniture truck is supported solely by the four legs resting on the floor surface.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of one embodiment of a furniture truck constructed in accordance with the invention;

FIG. 1*a* is a fragmentary view illustrating one of the supporting elements at its expanded position;

FIG. 2 is a front view of the furniture truck illustrated in FIG. 1;

FIG. 3 is a plan view of the furniture truck illustrated in FIG. 1;

FIG. 4 is a side elevational view of another embodiment of a furniture truck constructed in accordance with the present invention;

FIG. 4*a* is a fragmentary view illustrating one of the supporting elements at its fully expanded position;

FIG. 5 is a front view of the furniture truck illustrated in FIG. 4 with the pantographic linkage at an expanded position; and

FIG. 6 is a plan view of the furniture truck illustrated in FIG. 4 with the jacking leg operating mechanism deleted for clarity of illustration.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Looking now in greater detail at the accompanying drawings, FIGS. 1–3 illustrate a furniture truck including a base structure **10** preferably formed of four 2-inch steel tubing beams **12** joined at the ends thereof in a rectangular shape and having four caster assemblies **14** welded to the beams **12** at the midpoints thereof, the caster assemblies **14** including wheels **16** and pivot plates **18** which permit free pivotal movement of the wheels **16** with respect to the base structure **10**.

The base structure **10** includes four base elements **20**, preferably made of 1¼-inch square tubing, extending longitudinally in parallel relation with their respective ends joined to opposite beams **12** as best seen in FIG. 3, and each base element **20** has a sleeve element **22** carried exteriorly thereon for movement therealong in a manner to be described in greater detail hereinafter below. Connected to each sleeve element **22** is a generally S-shaped support arm **24** having a straight center portion **26** and opposite end portions **28,28'** extending generally perpendicularly from the center portion **26** in opposite directions, the end portion **28** of each support arm being welded or otherwise fixed to one of the sleeve elements **22** and the other end portion **28'** being likewise fixed to a supporting element **30**. A brace **34** (FIG. 1) may be added between each sleeve element **22** and supporting element **30** to provide additional strength. There are two supporting elements **30**, each of which is mounted on two of the support arms **24** so that they extend in spaced parallel relation above the base structure **10** as best seen in FIG. 3, and these supporting elements **30** are in the form of inverted channel members which present a relatively large, flat surface at the upper side thereof on which a furniture frame can be supported. The supporting elements are formed with apertures **32** which permit protective padding (not shown) to be secured at the top surface of the supporting elements **30** to prevent marring of a supported furniture frame as it is being worked upon.

Lateral movement of the supporting elements **30** with respect to one another is permitted by virtue of the sleeve elements **20** as previously mentioned. In accordance with the present invention, each sleeve element **22** has a pair of longitudinally spaced rollers **36, 36'** journaled therein with one of the rollers **36** being located adjacent one end of the sleeve element **22** at the upper interior surface thereof and with the other roller **36'** being located adjacent the other end of the sleeve element **22** at the lower interior surface thereof, and each sleeve element **22** is mounted at a tilted dispostion on its respective base element **20** as best seen in FIG. **1** with the roller **36** disposed to ride the upper exterior surface of the base element **20** and with the roller **36'** disposed to ride the lower exterior surface of the base element **20**.

It will be noted that since each support arm **24** is arranged to extend substantially beyond the end of its associated sleeve element **22** at which the upwardly disposed roller **36** is located (see FIG. 1), the combined weight of the support arm **24**, the attached supporting element **30**, and the furniture frame load carried by the supporting element **30** act to create a force couple by which upward and downward forces are supported, respectively, at the roller **36'** and the roller **36** to maintain these rollers in riding contact with base element **20**, the extent of support arm **24** beyond the end of sleeve element **22** at which roller **36** is located being sufficient to impose a biasing weight therefrom by which such riding contact is maintained as shown.

Thus, the supporting element **30** shown at the right side of FIG. 3 is carried by the two sleeve elements **22** at left side of FIG. 3, and it is movable in a lateral direction toward and away from the other supporting element **30** (see FIG. 1a) which is likewise laterally movable on the two sleeve elements **22** shown at the right side of FIG. 3. This selective lateral movement of the supporting elements **30** permits the spacing therebetween to be varied substantially whereby many different furniture frames can be properly supported by the supporting elements **30**. It has been found that a spacing range varying between a minimum of **20** inches and a maximum of **50** inches provides excellent results for the furniture truck shown in FIGS. 1–3.

It will be noted also that the mounting arrangement of the sleeve elements **30** on the base elements **20** eliminates the need of providing the close tolerances normally required between relatively movable parts. The rollers **36** and **36'** are journaled at the end portions of the sleeve elements **30**, and the sleeve element **30** is then tilted and passed onto the base element **20** whereupon the aforementioned load characteristics on the sleeve element **30** will cause it to assume a supported position on the base element **20** with the rollers **36, 36'** in contact therewith.

As previously discussed, it is desirable at times to have the furniture truck of the present invention supported in a completely immobilized fashion, as, for example, when a supported furniture frame is being worked upon at an operating station. Accordingly, the rectangular base structure **10** of the furniture truck of the present invention is provided at the corners thereof with a stationary length of square tubing **38** in which a smaller jacking leg **40** is telescopically carried and biased upwardly therein by an entrapped compression

spring (not shown) so that these legs 40 are normally carried in an inoperative raised position as shown in FIG. 1. An operating arrangement is provided for simultaneously lowering all four of the legs 40, and this operating arrangement comprises an eccentric element 42 mounted adjacent the top of each leg member 40 in contact therewith. Two of the eccentrics 42 are fixed in off-center relation to the opposite ends of an operating shaft 44, and the other two eccentrics are similarly mounted at the ends of an operating shaft 46. Each of the operating shafts 44, 46 is rotatably carried in fixed bearings mounted on the base structure 10 so that the two eccentrics 42 carried by each of the shafts 44, 46 will rotate together. One eccentric 42 of each connected pair has a projecting ear 48 welded thereto, and each projecting ear 48 is connected through an associated link 50 to an operating lever 52. The operating lever 52 is pivotally mounted on a pivot shaft 54 carried in an upstanding bracket 56, and the two links 50 are connected to the operating lever 52 at spaced points 58, 60 respectively, lying on opposite sides of the pivot shaft 54.

To lower the legs 40, the operating lever 52 is pivoted in a clockwise direction from its FIG. 1 position thereby causing one link 50 to rotate the right eccentric 42 in a counterclockwise direction and causing the other link 50 to rotate the left eccentric 42 in a clockwise direction. As previously described, the rotation imposed on these two eccentrics 42 is transmitted to the respective paired eccentrics 42 by operating shafts 44, 46 so that all four eccentrics 42 rotate simultaneously, and the throw of these rotating eccentrics 42 results in a downward displacement of all four legs 40 until they extend beyond the lowest extremity of the wheels 16 as may be seen in FIGS. 4 and 5 where the legs 40 of a corresponding jacking arrangement are shown in connection with another embodiment of the present invention at their lowered position. At this lowered or operative position of the legs 40, the wheels 16 are of course disposed at an elevated position above the floor surface S, and the furniture truck is supported in a fixed position solely by the four legs 40. To raise the legs 40, the operating lever 52 is pivoted in a counterclockwise direction and returned to its FIG. 1 position whereupon the eccentrics 42 will be returned to their FIG. 1 positions and the aforementioned compression springs will return the legs 40 to their raised position.

The alternate embodiment of the present invention illustrated in FIGS. 4—6 has a number of components which correspond to similar components in the embodiment illustrated in FIGS. 1–3, and these corresponding components in the alternate embodiment have corresponding reference numerals. For example, the jacking leg arrangement in both embodiments is substantially identical and operates in substantially the same manner, and the movable sleeve elements 22 are similarly carried on base elements 20 in both embodiments.

In the embodiment illustrated in FIGS. 4–6, however, the spaced supporting elements 30 are arranged somewhat differently to provide for even an greater range of movement thereof with respect to each other and also with respect to the base structure 10. Thus, looking at FIGS. 4 and 5, the four sleeve elements 22 each have mounted thereon an L-shaped support arm 62 have a short vertical section 64 and a long horizontal section 66 extending beyond one end of the sleeve element 22 on which each respective support arm 62 is mounted. A slide bearing 68 is fixed to the extending end of each horizontal support arm section 66, and a slide rod 70 is carried in each slide bearing 68 for horizontal sliding movement therein. A bracket member 72 is arranged to extend perpendicularly across the extending end portions of the two horizontal sections 66 which are located at each side of the base structure 10, and the bracket member 72 includes bifurcated depending flanges 74 which receive the ends of slide rods 70. Thus, each of the bracket members 72 is slidable from a position overlapping the extending ends of two horizontal sections 66 as seen in FIG. 4 to a second position projecting beyond such ends as seen in FIG. 4*a*.

Each of the bracket members 72 includes centrally located upstanding flanges 76, and two end flanges 78 in which two stationary rods 80 are mounted to extend in parallel relation therebetween. A pair of pantographic linkages, each including four links 82, 84, 86 and 88 are attached to each bracket 72 by pivotally connecting the lower ends of links 82 and 84 to the fixed upstanding flanges 76, and by pivotally connecting the lower ends of links 86 and 88 to slide pieces 90 which are slidably carried on the rods 80. The upper ends of links 82 and 84 are pivotally secured respectively to slide pieces 92, 94 slidably carried on rods 96 mounted endwise in each supporting element 30 by depending flanges 98, and the upper ends of links 86 and 88 are pivotally connected to fixed flanges 100 depending from each supporting element 30 at the center thereof. The slide pieces 94 for each supporting element 30 are threaded to receive a screw rod 102 having a hand wheel 104 fixed at one end thereof and being rotatably mounted in the bracket member 72.

With the above-described construction, the supporting elements 30 are selectively movable in a lateral direction with respect to one another, and they are selectively movable in a vertical direction with respect to the base structure 10. This selective lateral movement of the supporting elements 30 is made possible primarily by the sleeve elements 22 being movable along base elements 20 in the same manner as that described in connection with the embodiment illustrated in FIGS. 1–3, and FIG. 4*a* illustrates the right-hand supporting element 30 in FIG. 4 at a laterally expanded position. In addition to the laterally movement permitted by the movable sleeve elements 30, it will be noted in comparing FIGS. 4 and 4*a* that additional lateral movement of the supporting elements 30 is made possible by the bracket members 72 being slidable in slide bearings 68 to a position projecting beyond the extending end of horizontal sections 66 as previously described. It has been found in this embodiment of the present invention that excellent results are obtained in supporting a variety of furniture frames by providing for a minimum center spacing between the supporting elements 30 of about 28 inches and a maximum spacing therebetween of about 88 inches when the bracket members 72 are overlapping the ends of horizontal sections 66, as seen in FIG. 4, and about 100 inches when the bracket members 72 are extended as seen in FIG. 4*a*.

Selective vertical movement of the supporting elements **30** with respect to the base structure **10** is carried out by turning the respective hand wheels **104** to raise or lower one or both of the supporting elements **30**. When a hand wheel **104** is turned, the screw rod **102** attached thereto causes its associated slide piece **94** to move along the rod **96** and thereby cause gradational expansion or contraction of the pantographic linkages for respectively raising or lowering of the supporting element **30**. Again, nice results are obtained by providing the supporting elements **30** with a vertical adjustment ranging from a minimum height of 17 inches above the floor to a maximum height of 29 inches above the floor.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise to exclude any variation or equivalent arrangement that would be apparent from, or reasonably suggested by the foregoing disclosure to the skill of the art.

I claim:

1. A device for supporting furniture frames or the like during upholstering thereof, said device including a base structure and a pair of spaced supporting elements mounted thereon by means permitting selective lateral movement of at least one of said supporting elements with respect to the other, said mounting means including a sleeve element carried exteriorly on a laterally extending base element for movement therealong and including a support arm fixed to said sleeve element and extending longitudinally beyond one end thereof to a connection with said one of said supporting elements, said sleeve element being carried on said base element by a pair of longitudinally spaced rollers journalled therein and disposed, respectively, to ride the upper and lower surfaces of said base element with the roller disposed for riding said upper base element surface being located substantially nearer said one end of said sleeve element, and the extent of said support arm beyond said one end being sufficient to impose a biasing weight therefrom on said sleeve element by which said spaced rollers are maintained in riding contact with said base element.

2. A device for supporting furniture frames or the like as defined in claim **1** and further characterized in that the other of said spaced supporting elements is also mounted on said base structure for selective lateral movement by mounting means corresponding to said mounting means for said one of said supporting elements.

3. A device for supporting furniture frames or the like as defined in claim **1** and further characterized in that said support arm is formed with a straight center portion and opposite end portions extending generally perpendicularly from said center portion in opposite directions, one of said end portions being connected to said sleeve element at a point thereon located between said spaced rollers, and the other of said end portions being connected to said one of said supporting elements.

4. A device for supporting furniture frames or the like as defined in claim **1** and further characterized in that said one supporting element is connected to its support arm through a pantographic linkage arranged to permit said one supporting element to be moved vertically with respect to said support arm, and in that selectively operable means are associated with said pantographic linkage to cause gradational expansion or contraction of the same for respectively raising or lowering said one supporting element with respect to said support arm.

5. A device for supporting furniture frames or the like as defined in claim **4** and further characterized in the lower portion of said pantographic linkage is carried by a bracket member slidably mounted on the extending end portion of said support arm for movement between a first position overlapping said extending end portion and a second portion projecting beyond said extending end portion.

* * * * *