Feb. 8, 1966 M. A. TURTURRO ETAL 3,233,759

HOUSE LOADING TRAILER

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FIG. 1

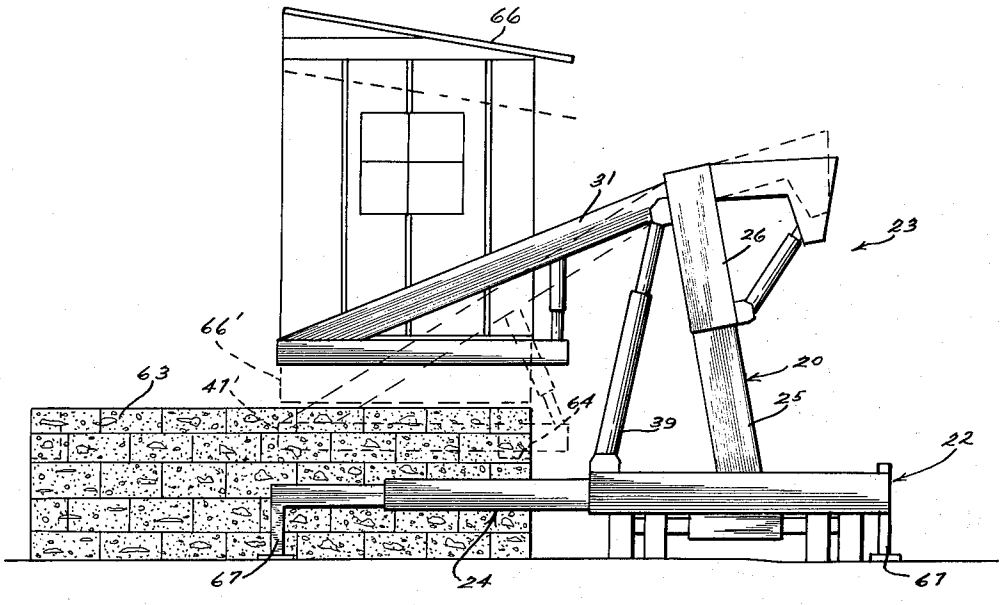

FIG. 2

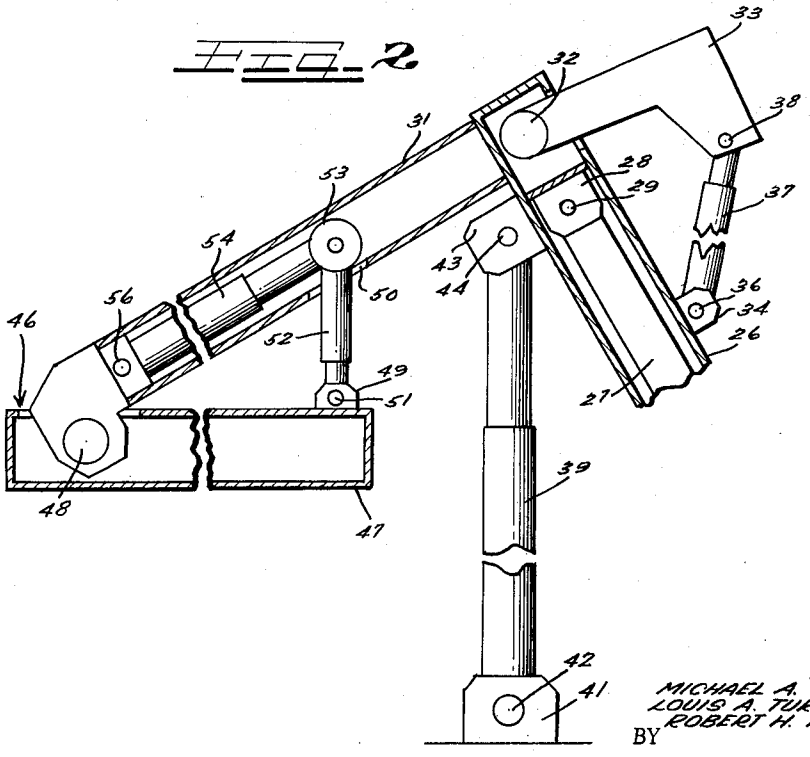

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FIG. 3

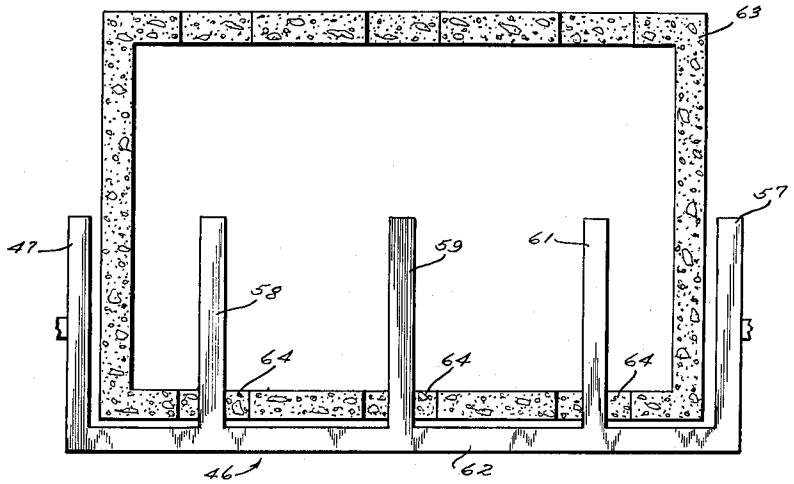

FIG. 6

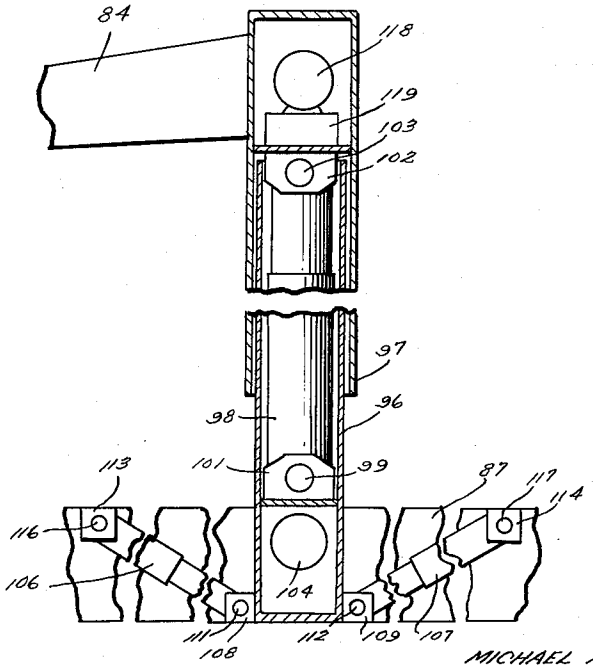

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FIG. 4

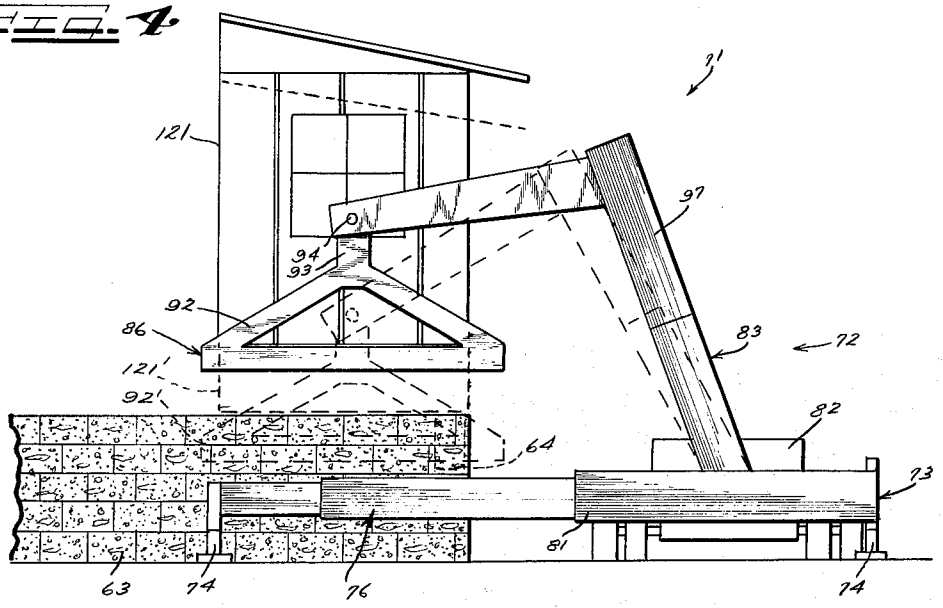
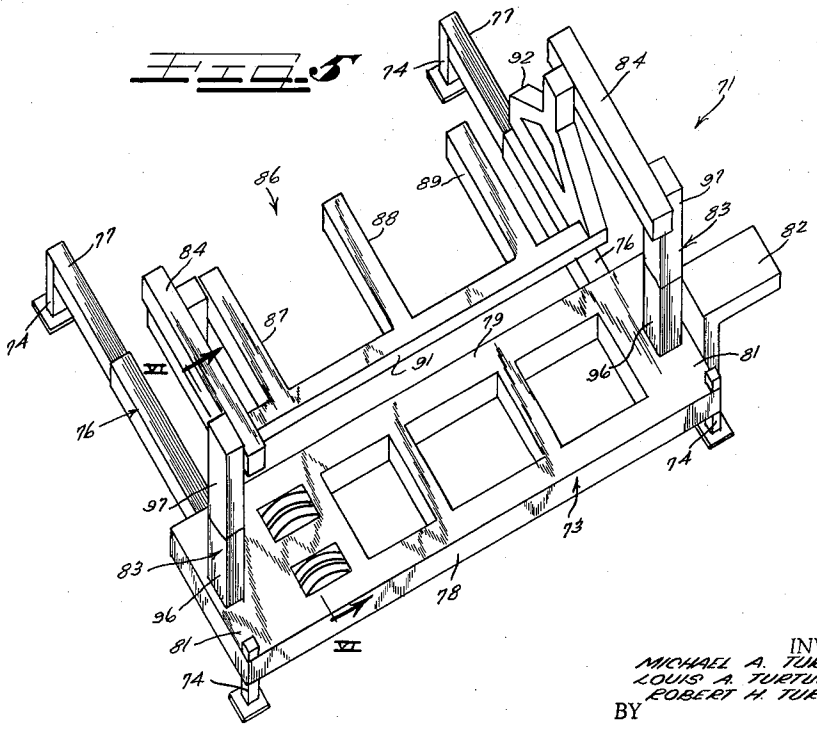


FIG. 5



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HOUSE LOADING TRAILER

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Filed Feb. 9, 1962, Ser. No. 172,279
3 Claims. (Cl. 214—80)

This invention generally relates to means and method for loading, transporting and unloading articles of manufacture and more specifically relates to a trailer that loads, transports and unloads articles of manufacture.

The trailer of the present invention is mainly described in connection with loading, transporting and unloading preconstructed house units that are used to build a house at a desired erection location. Houses have been traditionally built with precut materials which are assembled at the erection site. The instant invention however, utilized preconstructed house units which are units containing a certain number of rooms depending upon the design of the house to be erected. The preconstructed house unit has installed therein all necessary wall fixtures, appliances, electrical wiring, plumbing, wall papering, plastering, painting etc. that are necessary to have the rooms in a complete livable condition.

These units are delivered to a foundation where they are united into a complete house. The house is made livable in a matter of days and not the matter of months required by the assembling of precut material at the erection site. Further, an advantage of building a house with preconstructed house units is that it eliminates the problems arising from changes in weather. The house units are built indoors which is more economical and which eliminates all weather hazards.

There are not any known means or methods of effectively transporting preconstructed house units to an erection site without causing damage to the units. The prior art previously moved houses or similar structures by jacking and rolling the houses onto a trailer bed. This submitted the houses to frictional movement. Also, known loading and unloading means tilted the houses during the loading and unloading. When a house is subjected to frictional drag or tilting, the stress on its support weakens the structure of the house and causes the walls to crack, installed appliances are damaged, and the house, when finally on the foundation, is in need of extensive repairs.

By the use of the hereinafter disclosed trailer, preconstructed house units or houses may be loaded, transported and unloaded without the need for extensive repairs or any repairs at all.

It is therefore an object of the present invention to load, transport and unload a house or preconstructed house unit by frictionless movement of said preconstructed house unit in an unstressed condition.

It is a further object of the instant invention to provide a means and method of loading, transporting, and unloading large articles of manufacture by maintaining said articles on a substantially horizontal plane during said loading, transporting, and unloading operations.

It is further an object of the present invention to provide an apparatus and method for loading, transporting, and unloading preconstructed house units by frictional free movement of the preconstructed house unit, maintaining the house unit on a substantially horizontal plane, and continuously supporting said preconstructed house unit.

It is further another object of the present invention to provide a method of erecting a house utilizing preconstructed house units and a trailer.

It is further an object of the present invention to provide a trailer and method of loading, transporting and unloading preconstructed house units by vertically raising and lowering and transversely moving said preconstructed house units by pivotal means on the trailer.

It is another object of the present invention to provide a trailer and method of loading, transporting and unloading preconstructed house units by vertically raising said preconstructed house units with a lift which is pivotally connected to a trailer bed and laterally moving said preconstructed house unit over said trailer bed by pivoting said lifting means and a preconstructed house unit support and maintaining the preconstructed house units during the loading, unloading and transporting operation on a substantially horizontal plane.

Other objects, features and advantages of the present invention will be apparent from the following detailed description taken in conjunction with the accompanying drawings.

On the drawings:

FIGURE 1 is a rear view of a trailer of the instant invention in a position to unload a preconstructed house unit onto a foundation.

FIGURE 2 is a transverse cross section of the loading and unloading mechanism of FIGURE 1.

FIGURE 3 is a top view of the rack used to support the preconstructed house unit, in the accommodating slots of a house foundation.

FIGURE 4 is another trailer of the instant invention in position to lower a preconstructed house unit onto a house foundation.

FIGURE 5 is an isometric view of the trailer in FIGURE 4.

FIGURE 6 is a transverse cross section of the pivotal lift taken along lines VI—VI of FIGURE 5.

As shown on the drawings:

The instant invention advantageously utilizes the ability of a trailer to use highways with ready access. The instant invention involves erecting a house of a desired design at a desired location in a matter of days by using preconstructed house units. The preconstructed house units are assembled at an indoor factory and are completely equipped and finished. When they are united upon a prebuilt foundation, the house formed is in a livable condition.

The present invention accomplishes the uniting of the preconstructed house units with the trailer which is the subject of the instant invention.

The trailer of the instant invention has mounted thereon a rack which is capable of being positioned under a preconstructed house unit on a loading platform. The preconstructed house unit is vertically raised by the rack off the loading platform with a friction-free movement of the house unit and without tilting the unit. The unit is then transversely moved over a trailer bed by pivotal lifting means connected to the rack. The trailer, which has been levelized by levelizing jacks prior to the beginning of the loading operation, lowers the rack until it rests on the trailer bed. The levelizing jacks are raised and the trailer delivers the preconstructed house units over the highways to an erection site. Throughout this entire operation the trailer has maintained the house unit on a substantially horizontal plane and the house unit was not subjected to any frictional movement.

There is a foundation already built at the erection site. It has accommodating slots or receiving recesses therein to accommodate the rack house unit supports. The trailer maneuvers along side the foundation, levelizes itself with its levelizing jacks. The levelizing jacks maintain the trailer on a level and eliminate any hazards which may occur due to a flat tire or the breaking of a spring during the unloading operation. After the levelizing jacks are put in position, the trailer may be further stabi-

lized by extending stabilizing arms along side the house foundation from the loading-unloading side of the trailer to prevent tipping or unbalancing of the trailer during the unloading operation.

The trailer now being in position and being stabilized raises the preconstructed house unit above the level of the house foundation. The rack and unit are laterally moved over the house foundation by pivoting the lifting means and rack arm. When the rack is in position over the foundation the rack is lowered slowly until the preconstructed house unit rests on the house foundation and the rack supporting means is accommodated by the slots in the house foundation. The rack is then lowered and disengaged from the bottom of the house unit. When the rack is completely disengaged from the preconstructed house unit, it is slid from beneath the preconstructed house unit through the accommodating slots. The rack is then returned to the trailer bed and supported thereon. The stabilizing means and levelizing jacks are disengaged from their operating position.

The trailer having successfully loaded, transported, and unloaded the preconstructed house unit, while maintaining it on a substantially horizontal plane and with substantially friction-free movement of the house unit, is now ready to be returned to the factory to load another preconstructed house unit.

Referring to FIGURE 1 there is shown a trailer **21** of the present invention having a trailer bed **22**, loading and unloading means **23** mounted on each end of the trailer bed, and stabilizing means **24** extended from the loading-unloading corners of the trailer bed.

The loading and unloading means **23** is best described by FIGURE 2. It comprises a raising and lowering means or lift **20** having an extension **26**, a base **25**, and connected therein a hydraulic cylinder means **27**. The cylinder **27** is pivotally connected at its top portion by a plate **28** and a pin **29** mounted within the top of lift extension **26**. The cylinder **27** and base **25** are pivotally connected to the trailer bed portion the same as the lift base **96** shown in FIGURE 6.

A rack arm **31** is pivotally connected to the top extension **26** by a pin **32**. The pin **32** also connects a pivot arm **33** which is used to pivot the rack arm **31** about the pivot pin **32**. The pivot arm **33** is also connected to the lower portion of extension **26** by a hydraulic actuating means **37**. The hydraulic cylinder **37** is connected to the extension by a pivot plate **34** and a pin **36** and to the pivot arm **33** by the pin **38**. The cylinder **37** actuates pivot arm **33** which correspondingly pivots the rack arm **31** through geared pivot pin **32**.

At the loading-unloading corners of the trailer bed is a hydraulic cylinder **39** used to aid in pivoting the lift **20** and also to add additional support to the lift **20**. The cylinder **39** is connected to the loading-unloading corner of the trailer bed by a plate **41** and a pin **42** and to the upper end of the extension **26** by a plate **43** and a pin **44**. The cylinder **39** is pivotal at the two connection points **42** and **44** to facilitate the pivoting of the lift means **20**.

A rack **46** is pivotally connected to the end of the rack arm **31** at one end of its side by a pin **48**. At the other end of the rack side **47** and on top thereof is connected a pivot plate **49** connecting a hydraulic cylinder **52** by a pin **51**. The hydraulic cylinder **52** extends through a slot **50** into the rack arm **31** and is connected to a roller **53** within the rack arm. The roller **53** connects to the top of a cylinder **54** which has its base connected to an end of the rack arm adjacent the rack by a pin **56**. The roller **53** permits the cylinder **52** to move in either direction and to keep the rack on a substantially horizontal plane at all times with the aid of cylinder **54**.

It is understood that the unloading-loading means as just described, are mounted on both ends of the trailer bed and used to carry the rack **46**. The rack **46** has end side support frames **47** and **57**; preconstructed house unit support finger arms **58**, **59** and **61**; and a side frame **62** integrally connecting said end supports and said preconstructed house unit support finger arms.

As shown in FIGURE 3, the rack **46** is over a house foundation **63** having accommodating slots **64**. The support fingers **58**, **59** and **61** will be accommodated by said slots **64** so that the rack may be easily removed from beneath the house unit when the house unit is placed on the foundation **63**.

FIGURE 1 shows the trailer in position to lower a preconstructed house unit **66** onto the house foundation **63**. The trailer **21** is along the house foundation **63** and its stabilizing outriggers **24** extended along side the house foundation. Stabilizing jacks **67** which are mounted on the corners of the trailer bed **22** and the end of the outrigger **24** are in levelizing support position. The house unit **66** may be lowered to position **66'** and the rack lowered to position **47'** shown by the dotted lines in FIGURE 1.

This is accomplished while maintaining the house unit on a substantially horizontal plane and without any frictional movement of the house unit.

The rack is lowered, the house unit on the foundation **63**, the house support fingers disengaged from the bottom of the preconstructed house unit and in the accommodating slots **64**. The lift **20** is then pivoted away from the loading-unloading side of the trailer simultaneously while lowering of the rack arm **31**, thereby laterally sliding the rack from beneath the preconstructed house unit **66**.

When the boom **20** is perpendicular to the trailer bed, the pivoting of said boom lift **20** may be ceased and the lateral movement of the rack **46** accomplished by simultaneously lowering of the rack arm **31** and the raising of the extension **26**. When the rack **46** is over and aligned with the trailer bed the lift **20** is actuated and the rack **46** lowered onto the trailer bed. The levelizing jacks are raised and the outriggers **24** are retracted into the trailer bed and the trailer **21** having successfully loaded, transported, and unloaded the preconstructed house unit, while maintaining it in an upright unstressed condition on a substantially horizontal plane and with substantially friction-free movement of the house unit, is driven from the house foundation site to load another preconstructed house unit.

The drawings describe the loading of the preconstructed house unit from the side of the foundation closest to the trailer. However, when the foundation is on land which is not clear all around but on only on one face of the house foundation, the preconstructed house unit is first deposited upon the far side of the house foundation. To deposit the house on the far side with trailer **21**, it is necessary to erect a foundation that has its near front wall and a portion of its side walls finished only to the level of the base of the accommodating slots **64**. This enables the loading-transporting-unloading rack **46** to be slid out from beneath the preconstructed house unit on the far end of the foundation **63**. The unfinished portion of the house foundation is erected before a second preconstructed house unit is placed on a foundation to be united with the first preconstructed house unit on the foundation.

FIGURES 4–6 show a trailer **71** which has another type of pivotal loading and unloading means **72** mounted on a trailer bed **73**. The trailer bed shown in FIGURE 5 has two stabilizing jacks **74** mounted on the corners of the trailer bed **73** and a side **78** opposite a loading-unloading side **79** of the trailer bed. There are also levelizing jacks **74** on the ends of stabilizing outriggers **76** each of which has an extendable stabilizing arm **77**. It is understood that levelizing jacks may be used on all four corners of the trailer bed.

The trailer bed is composed of the side **78** and the unloading-loading side **79** connected by two ends **81**. Mounted on one end **81** of the trailer bed is a goose neck

82 which attaches to a truck chassis for transporting the trailer over highways.

One end of a rack arm 84 is pivotally mounted to the upper end of extension 97 by a geared pin 118.

At each end of the trailer bed 73 is a raising and lowering means or lift 83, as best described in FIGURE 6. The raising-lowering means is pivotally mounted within the trailer bed 73 and approximately centrally of the sides 78 and 79. The lift 83 comprises a base inner arm 96 and an upper outer extendable arm 97. The outer arm 97 is concentric with the inner arm 96. The outer arm is extended by a hydraulic cylinder 98 which is pivotally connected to the inner arm by a pin 99 and a pivotal plate 101, and to the outer arm by a pivotal plate 102 and a pivoting pin 103.

The entire raising and lowering means 83 is pivotally mounted to the trailer bed by a pin 104. The pivoting of the raising and lowering means 83 is accomplished by hydraulic cylinders 106 and 107 which are mounted within the ends 81 of the trailer bed. The hydraulic cylinders 106 and 107 are mounted on opposite sides of the raising-lowering means 83 with one extending towards the loading-unloading side 79 and the other extending towards the opposite side 78. The hydraulic cylinders 106 and 107 are mounted to the lower end of the base by pivotal plates 108 and 109 and pivotal pins 111 and 112. At their upper ends they are mounted onto the end 81 by pivotal plates 113 and 114 and pins 116 and 117.

The rack arm 84 is pivotally mounted to the raising and lowering means on top of its upper extension 97 by the geared pin 118. The rack arm 84 is raised and lowered or pivoted by a motor 119 which is mounted within the upper end of the extension 97 and is in drive engagement with the pin 118.

FIGURE 4 best describes how the apparatus is used to unload a preconstructed house unit 121 on a house foundation 63 which has accommodating slots 64 therein. The stabilizing outrigger 76 which may be retracted into the end 81 of the trailer bed, is extended to stabilizing position. The levelizing jacks 74 are lowered to levelizing engagement. The raising-lowering means 83 is actuated, and the rack 86 and the rack arm 84 are raised. The motor 119 is then actuated to pivot the rack arm 84 and raise the preconconstructed house unit and rack 86 above the foundation 63. The lift 83 is pivoted towards the loading-unloading side 79 and the rack arm 84 is simultaneously lowered to lower the preconstructed house unit 121 to a position 121' onto the foundation 63.

The house unit is maintained on a substantially horizontal plane due to the free pivot connection by the pin 94. The rack is then continuously lowered until the end 92 reaches the position 92' along side the house foundation 63. The preconstructed house unit support fingers 87, 88 and 89 are then disengaged from the bottom of the preconstructed house unit and within the accommodating slots 64. The rack 86 is then slid from beneath the house through the accommodating slots 64 by pivoting the raising-lowering means 83 towards the side 78. When the raising-lowering means 83 is perpendicular to the trailer bed, the continued lateral movement of the rack means, if necessary, is produced by raising the member 97 while simultaneously lowering the rack arm 84. When the rack 86 is over the trailer bed 73 the rack is lowered onto the trailer bed, the levelizing jacks raised, and the outriggers retracted in the trailer. It is of course understood, that the lateral movement of the rack 86 may also take place by continued pivoting of the means 83 towards the sides 78.

The trailer having successfully completed its job without submitting the house unit to frictional movement and maintaining it in an upright unstressed condition on a substantially horizontal plane is ready to load another preconstructed house unit thereon.

It is understood that these racks used herein may be modified by combining the fingers and thereby necessitating a large groove within the house foundation to accommodate such a rack. It is also noted that trailers and racks may have a solid construction. Such a construction is dependent upon highway regulations on trailer weight as well as trailer size. The fingers of the rack may be extendable, and the lifts may be modified in a manner which is expected of the skilled artisan.

Although various minor modifications of the present invention might be apparent to those skilled in the art, it is to be understood that we wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of our contribution to the art.

We claim as our invention:

1. A house unit trailer adapted to load, transport, and unload preconstructed house units comprising:
   - a house unit trailer bed having means to connect a truck cab thereto,
   - said trailer bed having a front end, a rear end, and an unloading side,
   - lift means extending upwardly from and pivotally mounted on each end of the trailer bed,
   - said lift means each having telescopic extension means,
   - a rack arm pivotally connected to each lift extension means,
   - a house unit rack extending substantially the distance between said lift means,
   - first pivot means pivotally connecting said house unit rack to each rack arm,
   - second pivot means connecting each rack arm to the house unit rack to adjust the horizontal level of the house unit rack,
   - means to pivot each rack arm, and
   - telescopic pivot means connected to each of said lifts and said trailer bed to pivot said lifts,

   whereby the house unit supported on the house unit rack may be raised off the trailer bed and laterally moved over a house foundation.

2. A house unit trailer adapted to load, transport, and unload preconstructed house units comprising:
   - a house unit trailer bed having means to connect a truck cab thereto,
   - said trailer bed having a front end, a rear end, and an unloading side,
   - lift means extending upwardly from and pivotally mounted on each end of the trailer bed,
   - said lift means each having telescopic extension means,
   - a rack arm pivotally connected to each lift extension means,
   - a house unit support means extending substantially the distance between said lift means,
   - first pivot means pivotally connecting said house unit support to each rack arm adjacent one side of said house unit support means,
   - second pivot means connecting each rack arm adjacent the other side of the house unit support means to adjust the horizontal level of the house unit rack,
   - a pivot arm connected to each rack arm to pivot each rack arm, means to actuate each pivot arm, and
   - telescopic pivot means connected to each of said lifts and said trailer bed to pivot said lifts,

   whereby the house unit supported by the house unit support means may be raised off the trailer bed and laterally moved over a house foundation.

3. A house unit trailer adapted to load, transport, and unload preconstructed house units comprising:
   - a house unit trailer bed having means to connect a truck cab thereto,
   - said trailer bed having a front end, a rear end, and an unloading side,
   - lift means extending upwardly from and pivotally mounted on each end of the trailer bed,
   - said lift means each having telescopic extension means that are operated simultaneously,

a rack arm pivotally connected to each lift extension means,

a house unit rack extending substantially the distance between said lift means and adapted to carry a house unit thereon,

first pivot means pivotally connecting said house unit rack to each rack arm adjacent one side of said house unit rack,

second pivot means connecting each rack arm adjacent the other side of the house unit rack to adjust the horizontal level of the house unit rack,

a pivot arm connected to each rack arm to pivot each rack arm,

means to actuate each pivot arm, and

telescopic pivot means connected to each of said lifts and said trailer bed to pivot said lifts

whereby the house unit supported on the house unit rack may be raised off the trailer bed and laterally moved over a house foundation.

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