Nov. 22, 1960 F. E. BEACH 2,961,250

CHAIR DOLLY

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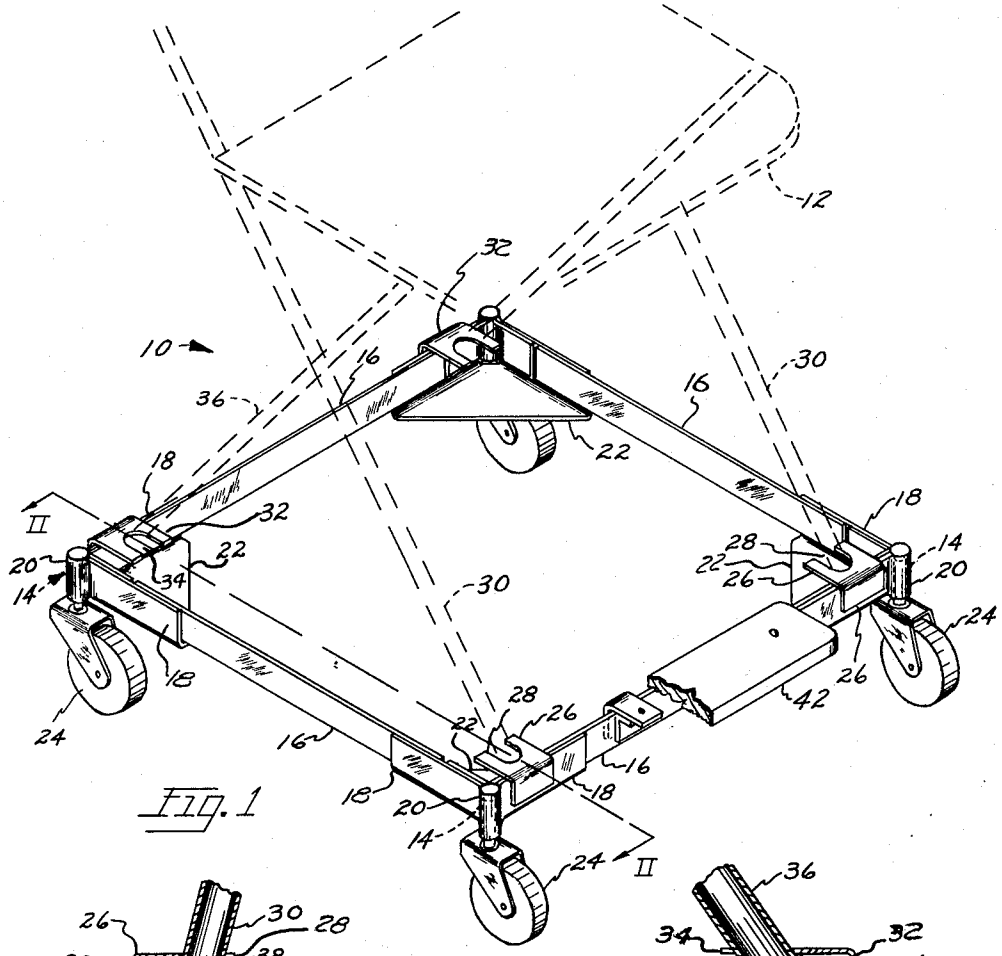


Fig. 1

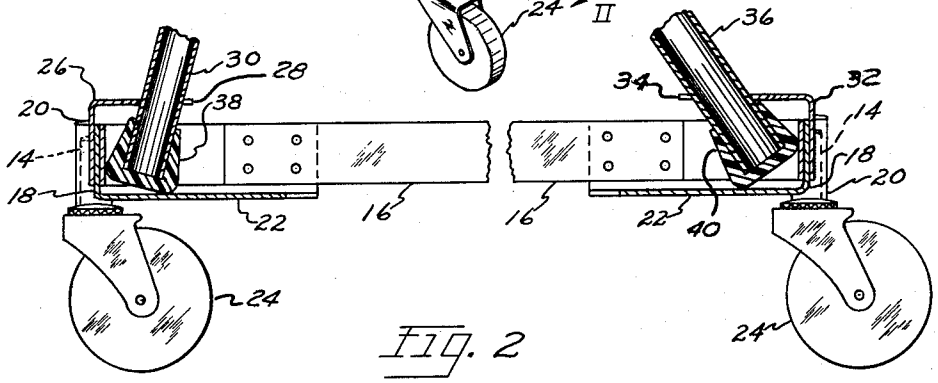


Fig. 2

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CHAIR DOLLY

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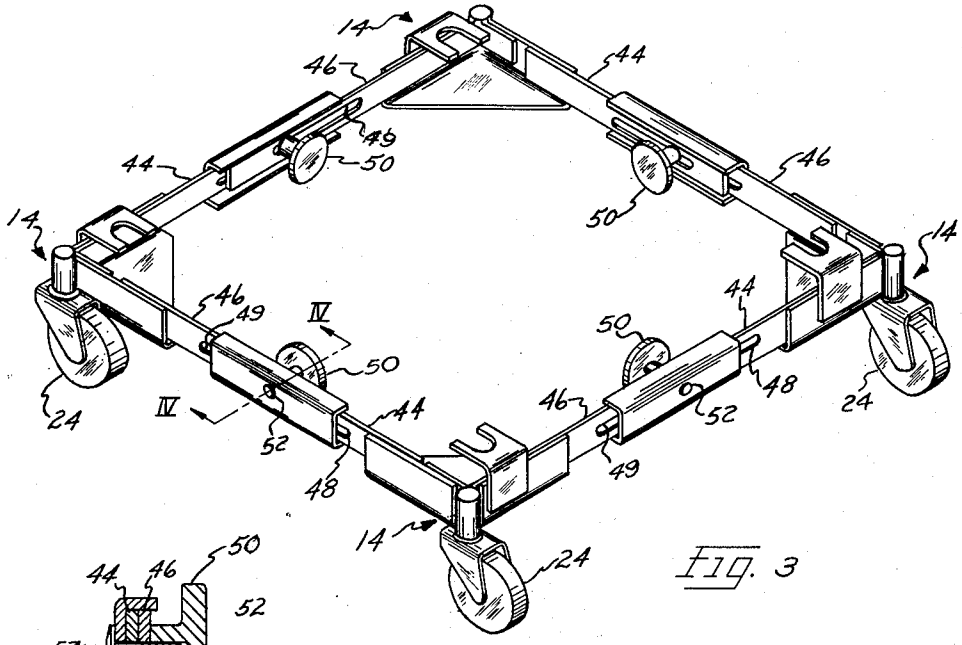


Fig. 3

Fig. 4

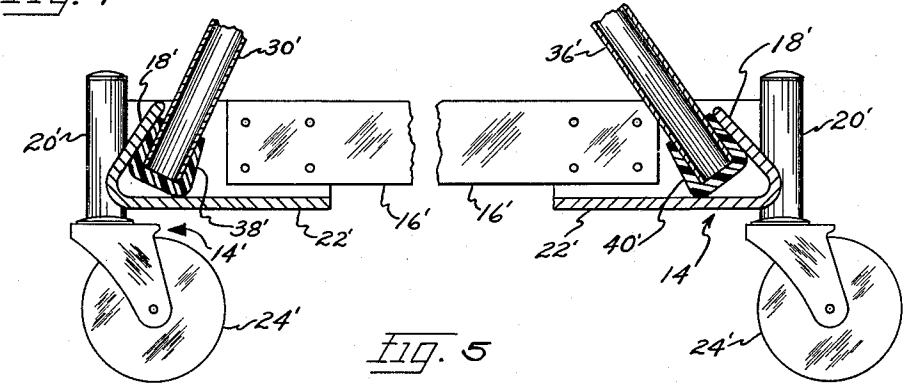


Fig. 5

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CHAIR DOLLY

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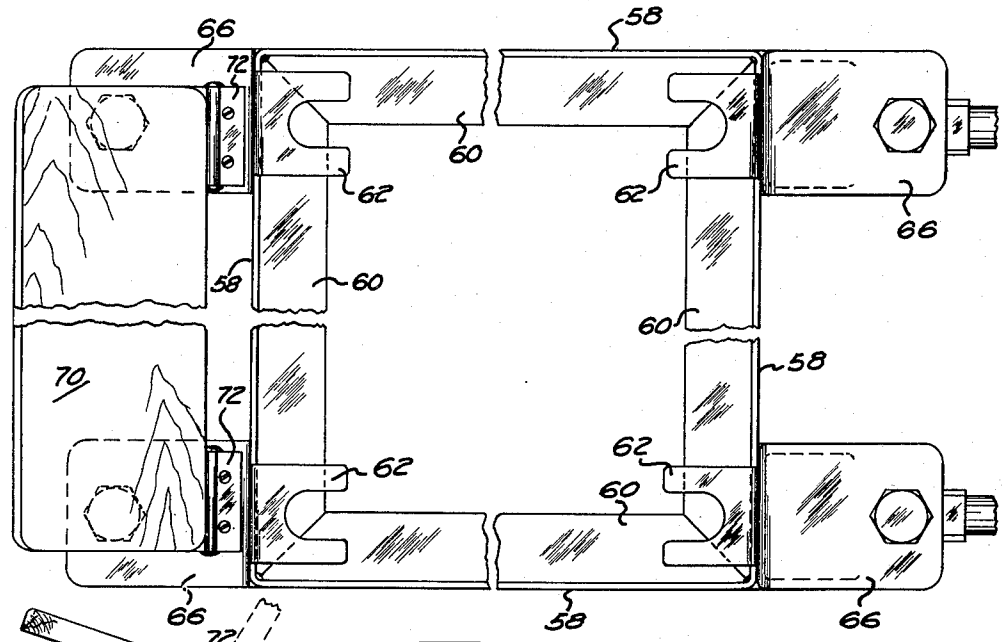


Fig. 6A

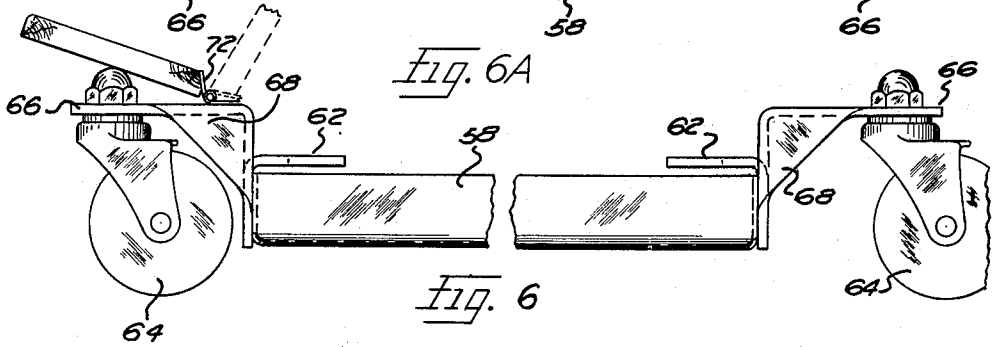


Fig. 6

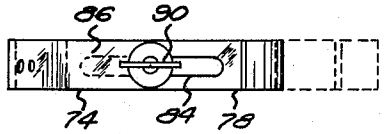


Fig. 8A



Fig. 8

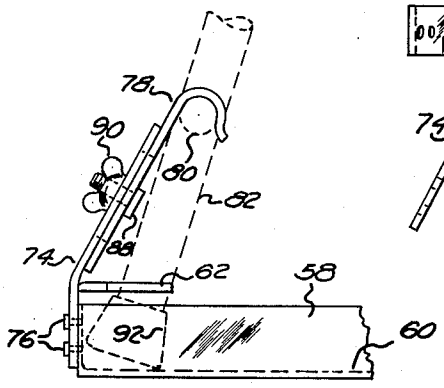


Fig. 7

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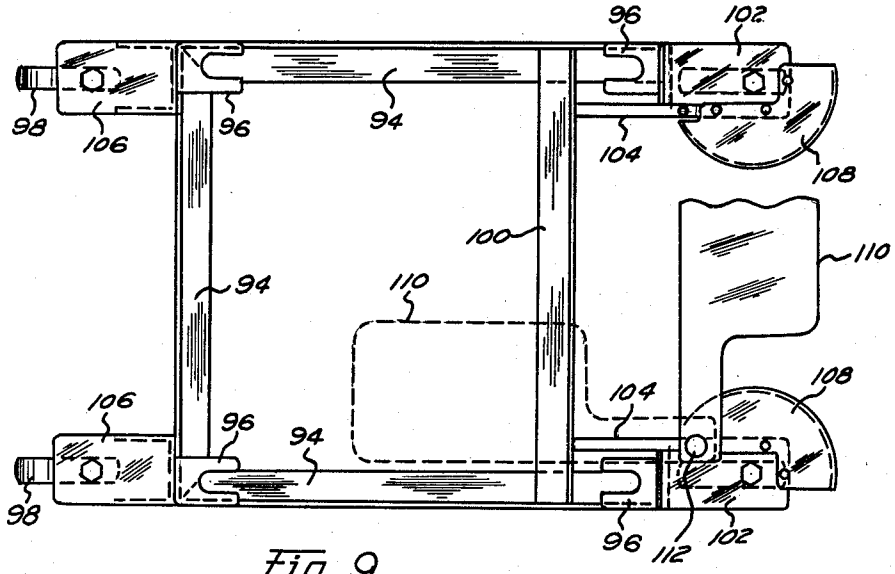


Fig. 9.

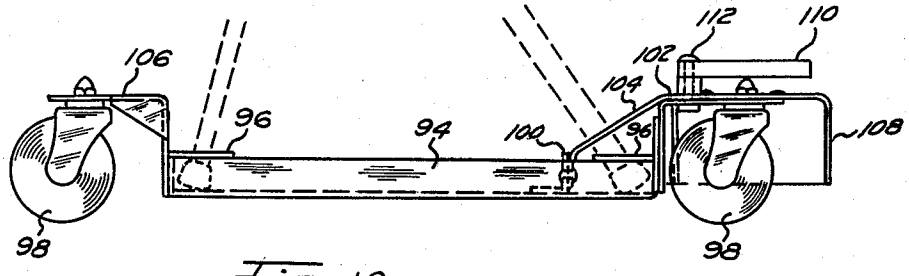


Fig. 10.

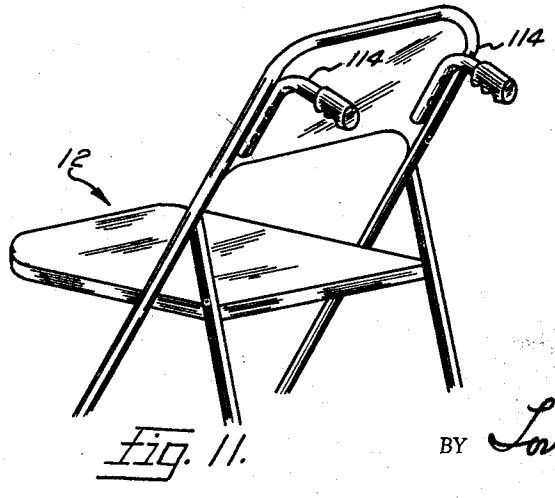


Fig. 11.

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2,961,250

Patented Nov. 22, 1960

2,961,250

CHAIR DOLLY

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Filed July 5, 1957, Ser. No. 670,005

3 Claims. (Cl. 280—35)

The invention relates to a chair dolly and particularly to a dolly for use with folding chairs.

The problem of moving non-ambulatory patients about a hospital, sanatorium, institution or private home, has been generally met by the use of the wheel chair. However, as the conventional wheel chair is of special design and is of rather complicated construction the wheel chair is expensive. Thus, the number of wheel chairs an institution or home can afford is limited and often inadequate. An acute situation arises when a sanitarium or large institution desires to move many patients at one time, as to attend a lecture or motion picture. To have the number of wheel chairs available necessary to accomplish such a mass movement would be prohibitive costwise and impractical. The invention contemplates the construction of a low cost dolly mounted upon casters or other anti-friction devices which is easily attached to a conventional folding chair thereby converting folding chairs into convenient means for moving patients from one place to another.

It is thus an object of the invention to produce a low cost dolly which may be used with a conventional folding chair permitting a non-ambulatory patient to be easily moved with safety and little effort.

Another object of the invention is to design a chair dolly which is used with a folding chair and cooperates with the locked unfolded chair to form a substantially integral and low gravity centered unit.

A further object of the invention is to construct a chair dolly onto which a conventional folding chair may be readily positioned and automatically locked to the dolly by opening the chair.

Yet another object of the invention is to produce a dolly for a folding chair which is universally adjustable and may be easily adapted to fit various size chairs.

These and other objects of the invention will become apparent when viewed with regard to the following description and accompanying drawings wherein:

Fig. 1 illustrates a chair dolly embodying the principles of the invention as assembled with a folding chair,

Fig. 2 is a cross-sectional elevation of the invention taken along the lines II—II of Fig. 1,

Fig. 3 is a perspective view of an adjustable embodiment of the invention,

Fig. 4 is a cross-section elevational view of the invention taken along the line IV—IV of Fig. 3,

Fig. 5 is a cross-section elevational view of another embodiment of locking means which may be used with the invention,

Fig. 6 illustrates yet another embodiment of the invention,

Fig. 6A is an elevational view of the embodiment of Fig. 6.

Figs. 7 and 8 illustrate an auxiliary clamping device which may be used with the chair dolly of the invention,

Fig. 8A is a top view of the clamping device shown in Fig. 8,

Figs. 9 and 10 illustrate another embodiment of the invention which enables the patient's feet to reach the floor for self-propulsion purposes, and

Fig. 11 is a perspective view of a chair with handles attached aiding in maneuvering the chair dolly over curbs, thresholds, or the like.

As seen in Fig. 1 the chair dolly **10** of the invention may take a substantially rectangular form in which a conventional folding chair **12** is supported. The dolly **10** consists of four caster supports **14** which form the corners of dolly **10** and are held in the proper spacial relationship by ribs **16**. As will be noted the ribs **16** are riveted to supports **14**. However, any fastening means may be used.

The supports **14** are formed with sides **18** which lie in vertical planes, at right angles to each other intersecting at the cylindrical housing **20**. A web **22** is formed integral with sides **18** connecting the lower edges thereof whereby each support defines a three sided pocket bounded by sides **18** and web **22**. The housings **20** are formed with a recess in the lower end whereby the stem of a caster **24** may be inserted and is rotatably supported. Casters **24** are all of the swivel type permitting 360° rotation enabling the dolly to be easily pushed in any direction.

Two pairs of locking yokes are used to hold the chair **12** to the dolly **10**. Yokes **26** are fastened to a pair of supports **14** at the upper edge of sides **18** so as to be placed on the same side of dolly **10** in parallel relation. The openings **28** of yokes **26** face inwardly and are of a size sufficient to accommodate the front legs **30** of chair **12**. The rear yokes **32** are fastened to the other supports **14** in opposing relation to the front yokes **26**, the openings **34** face inwardly and receive the rear legs **36** of chair **12**.

As will be noted in Fig. 2, the legs **30** and **36** are provided with protective tips **38** and **40**, respectively, which are resilient providing a non-skid footing for chair **12**. The tips **38** and **40** are assembled to most conventional folding chairs now being manufactured and are usually cemented or otherwise firmly affixed to the chair legs. The tips **38** and **40** slide under yokes **26** and **32** while the spacing between openings **28** and **34** is such that the chair legs **30** and **36** snugly fit within the openings when the chair **12** is fully unfolded. The front and rear legs of the conventional folding chair diverge as the legs extend downwardly and it is this construction which provides the rigid locking of the chair **12** to the dolly **10**.

Thus, the rear legs **36** may be placed on the webs of the rear supports **14** in front of the openings **34** of yokes **32**, the chair **12** is then unfolded causing legs **30** to approach yokes **26**, continued opening of the chair will slide the tips **38** under yokes **26** and the legs **30** into the openings **28**, as the legs **30** are restrained against further movement by opening **28** and side **18** the rear legs **36** will move back into yokes **32** during the final movements of opening chair **12**. The legs **30** and **36** will appear as in Fig. 2 when the chair is fully opened. Since the chair legs diverge and fit snugly within openings **28** and **34** a "tongue and groove" effect is achieved preventing the chair **12** from being removed from the dolly as long as the chair is locked in the open or unfolded position. Additional locking is provided by the tips **38** and **40** which would engage the lower side of yokes **26** and **32** if it is attempted to lift the chair from the dolly **10**. It will be appreciated that the patient's weight in the chair seat will insure the chair remaining locked in the open or unfolded position. Thus, there

is no danger of the chair being lifted from the dolly while the patient is being pushed.

The weight of the chair **12** and patient will be supported by webs **22** and the tips **38** and **40** as though the chair were placed on a level floor, thus, no abnormal strains or stresses are imposed on the chair. Preferably, a footrest **42** is pivotally fixed to the front rib **16**, as shown, as a convenience for the patient.

A modification of the invention is shown in Fig. 3 which may be easily adapted to fit all sizes of folding chairs. Elements similar to those of Fig. 1 are designated with the same numerals and it is observed the modification utilizes the same supports **14**, sides **18**, webs **22** and casters **24**. Adjustability is achieved by the use of a pair of overlapping ribs **44** and **46** affixed to the supports **14**. The rib **44** is provided with a longitudinal slot **48** formed in rib **44** while rib **46** is formed with a slot **49**. The ribs **44** and **46** are frictionally held together by knob **50** and U-shaped sectioned bracket **56**. A threaded stud **52** extending from bracket **56** passes through the slots **48** and **49** and the knob **50** is threaded thereon and may be tightened to bear against rib **46** maintaining relative adjustment of the ribs. The legs of bracket **56** overlap ribs **44** and **46** preventing the ribs from "jack-knifing." Thus, the ribs **44** and **46** may be longitudinally adjusted the length of slots **48** and **49**. As the above adjusting means are provided on each of the ribs connecting the supports **14**, the dolly of Fig. 3 may be regulated to fit all sizes of folding chairs.

A modification of the means for gripping the legs of the folding chair is shown in Fig. 5. Instead of using a yoke, one of the sides of the support **14'** are formed at an acute angle with the web **22'**. The angle of side **18'** is preferably equal to that of the supported chair leg whereby the opened chair will firmly engage the tips **38'** and **40'** to the sides **18'** preventing the chair from being disengaged from the dolly. The modification of Fig. 5 may be best utilized with folding chairs having a large included angle between the front and rear legs.

Another variation of chair dolly is shown in Fig. 6 which permits the chair to have a lower center of gravity than the prior embodiments. The dolly of Fig. 6 consists of a rectangular base which may be formed of angle iron and comprises vertical sides **58** and horizontal members **60** extending inwardly from the lower edges of the sides **58**. Yokes **62** are affixed to the sides **58** and project inwardly adapted to receive the legs of a folding chair as described of the embodiment of Fig. 1. The casters **64** are of the self-steering swivel type and are mounted on brackets **66** projecting up and away from the sides **58**. The webs **68** reinforce the brackets. A foot rest **70** may be hinged to the brackets **66** at **72** for the comfort of the chair occupant and swing out of the way for storing of the dolly. It will be apparent that this embodiment provides the minimum height of dolly and chair, increasing safety and mobility and also incorporates the novel interlocking structure between chair and dolly.

Figs. 7 and 8 illustrate a hold down clamp which may be used to hold folding chairs to the dolly of the invention wherein the construction of the chair does not permit a close interfitting between the chair legs and yokes. As seen in Fig. 7, the clamp **74** may be affixed to the side **58** by screws or bolts **76**. The adjustable hook element **78** is adapted to slip over a cross bow **80** of the chair legs **82** and the use of slots **84** and **86**, formed in clamp **74** and hook **78**, respectively, together with the bolt **88** and wing nut **90** permit the clamp to hold the chair leg tips **92** firmly in contact with the horizontal elements **60**. It will be understood that the clamps **74** are positioned adjacent the yokes **62** and may be used with any of the above described embodiments of chair dollies.

Figs. 9 and 10 disclose another embodiment of the invention particularly adapted to permit the chair occupant to propel the chair and dolly about through contact of the patient's feet with the floor. Preferably the dolly of this type is underslung in the fashion shown in Fig. 6 and consists of chair supporting angle ribs **94** mounting yokes **96** carried by the casters **98**. In order to provide sufficient clearance for the patient's feet the end rib member **100** is located intermediate the front and rear yokes **96**, the front casters are mounted on the brackets **102** which are fastened to the ribs **94** and reinforced by metal straps **104**, the rear brackets **106** are affixed directly to the end rib member and support the rear casters. The front casters are shielded by arcuate guards **108** mounted on the inside of brackets **102** preventing injury or entanglement of the chair occupant's feet with the casters. A foot rest **110**, pivotally mounted to a bracket **102** at **112**, may be swung into the position as shown in solid lines of Fig. 9 for support of the patient's feet or may be pivoted to the dotted line position when the patient desires to push the chair and dolly about with his feet.

When the dolly is to be used to transport non-ambulatory patients over thresholds, curbs and other raised obstructions, tilting of the chair and dolly may be easily facilitated by the attachment of handles **114** to the chair, as in Fig. 11, by the use of bolts, screws, wing nuts, or other conventional fastening means.

The dolly of Figs. 6, 9 and 10 may, of course, be provided with adjustable means, as in Fig. 3, to permit use of the dolly with any size of folding chair.

It will, therefore, be understood that the invention discloses a low cost means for converting a conventional folding chair into a wheel chair, making available to hospitals, sanitariums, homes, etc. an economical source of patient transporting chairs. The dolly, as shown in Fig. 1, may be manufactured in any size to fit a particular size or make of folding chair or may be adjustable as dolly of Fig. 3, adaptable to fit different size of chairs, thus, folding chairs already on hand may be used with the dollies. It will be appreciated that various types of yokes or overlapping means may be used to hold the chair legs in the dolly other than the two constructions shown without departing from the spirit and the scope of the invention.

In use, the dolly-chair combination herein disclosed may readily pass through narrow doors. Four, and in some cases even more, patients may be placed upon an average size elevator at one time. When aligned, an attendant may push two or even three patients at a time from one place to another.

Having thus described my invention, what I claim is novel and desire to protect by Letters Patent is:

1. A chair dolly for use with a folding chair having diverging front and rear leg members comprising a rectangular frame member consisting of four caster supported chair leg supporting portions, each of said leg supporting portions including vertically disposed side portions and a horizontal portion upon which the chair legs are supported, a caster affixed adjacent to each of said leg supporting portions for the support of said frame member, a pair of front chair leg engaging members mounted on the side portions of two adjacent leg supporting portions on a common side of said frame member, a pair of rear leg engaging members affixed to the side portions of the other two leg supporting portions on a common side of said frame member opposite to said first mentioned common side, said leg engaging members including portions extending over and vertically spaced above the horizontal portion of the associated leg supporting portion overlying a diverging portion of the chair leg supported upon the horizontal portion whereby said leg engaging means maintains the chair legs in supported position on the horizontal portion and locks the unfolded chair to the dolly, said side portions on which said leg engaging members are mounted engaging the chair legs upon unfolding of the chair.

2. In a chair dolly as in claim 1, wherein the portion of said leg engaging means extending over the horizontal portion comprises a yoke portion parallel to said hori-

zontal portion, an opening defined in said yoke portion intersecting the inner edge thereof receiving the chair leg and finger-like projections formed on said yoke portion adjacent said opening and extending at right angles to said side portions on which said leg engaging means are mounted adapted to engage opposite sides of the chair leg.

3. In a chair dolly as in claim 1 wherein a pair of perpendicularly disposed rib elements are affixed to said leg supporting portions and a longitudinal slot is defined in each of the ribs, means locking the ribs of adjacent leg supporting portions in contiguous relation comprising a bracket of U cross section adapted to engage one of the ribs on one side thereof and overlap the edges of a pair of ribs whereby the slots thereof are aligned and relative transverse rib displacement is prevented, a threaded stud extending through said bracket and the slots of ribs therein and nut means engaging said stud adapted to bear on the rib removed from said bracket whereby tightening of said nut frictionally maintains said ribs within said bracket.

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