

[54] **TROLLEYS**  
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 [58] **Field of Search** ..... **214/1 D, 1 A; 5/86**

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**FOREIGN PATENTS OR APPLICATIONS**

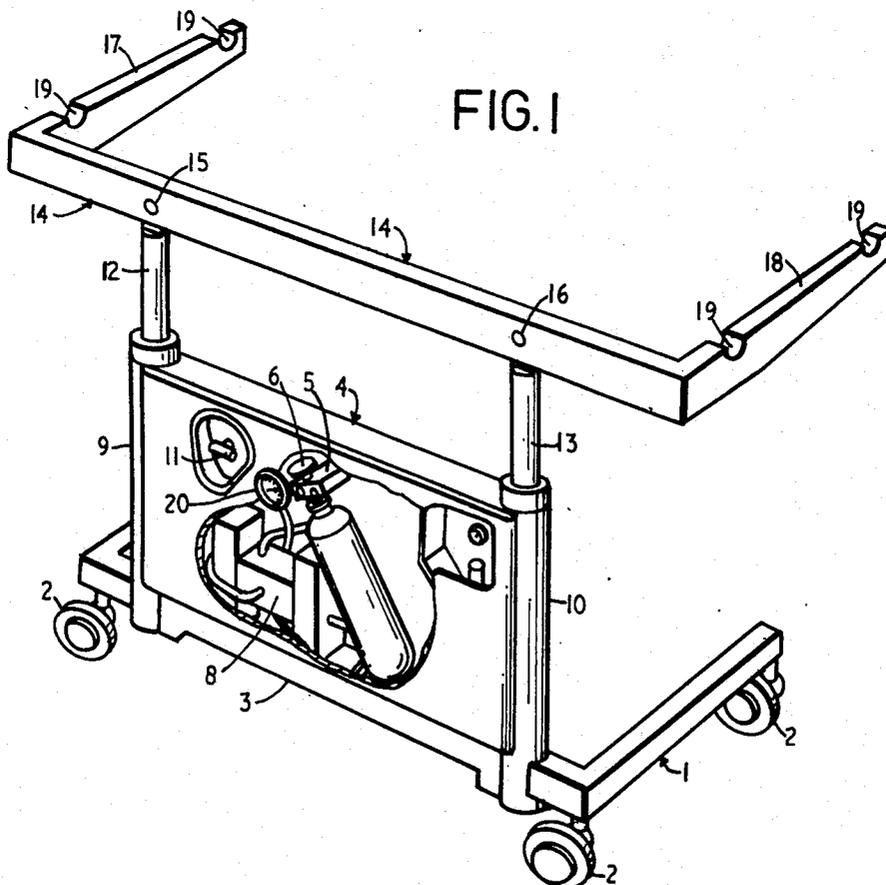
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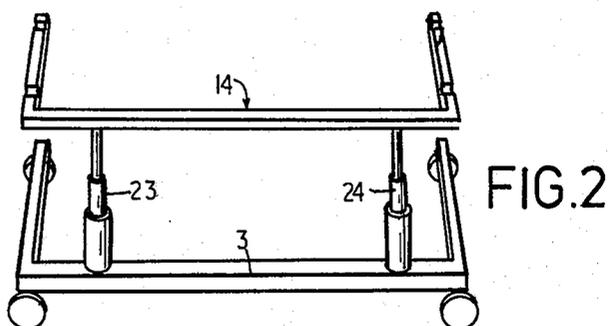
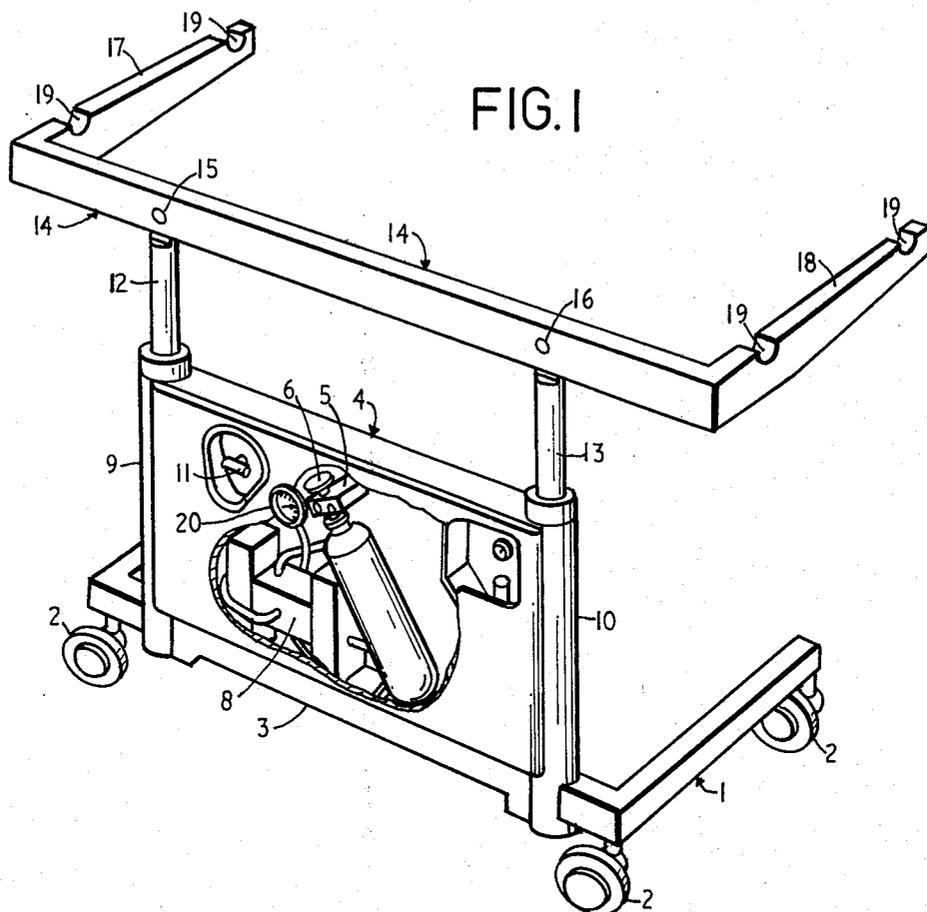
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[57] **ABSTRACT**

This invention relates to trolleys and in particular to a trolley for handling patients on a stretcher where in certain instances it is essential that the patient be moved as little as possible. Accordingly the important features of the trolley are a base frame on wheels, a stretcher support spaced from and above the base frame and means for raising, lowering and tilting the stretcher support relative to the base.

**2 Claims, 4 Drawing Figures**





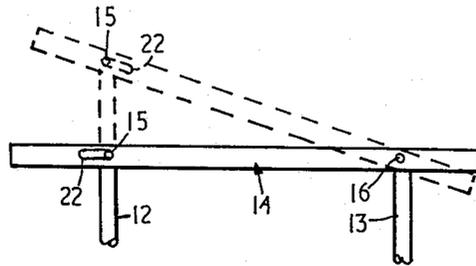


FIG. 3

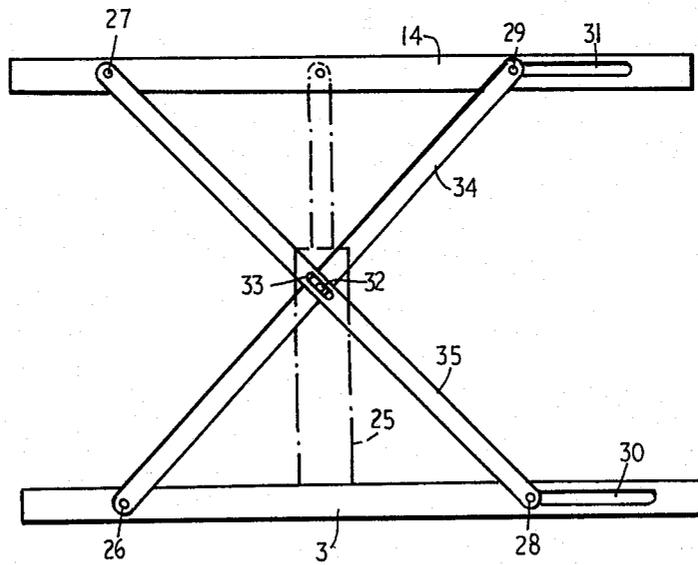


FIG. 4

## TROLLEYS

This invention relates to trolleys and more particularly to trolleys for handling patients in hospitals or the like.

In certain instances it is essential that a patient be moved as little as possible. Therefore it is advantageous that once the patient has been placed on a stretcher, say, following an accident, that he remain on the stretcher during the initial critical treatment period, as opposed, for example, to being transferred from the stretcher to a conventional trolley and then a further transfer from the trolley to the operating table. Such a transfer sequence could be extremely detrimental to successful treatment of the patient. Conventional trolleys also do not readily allow for access of radiographic equipment or the like to the patient while he is supported on the trolley. Further, in certain cases it is desirable to be able to tilt the patient.

The object of the present invention is to provide a trolley substantially free of the above deficiencies and which is capable of tilting a stretcher supported thereon.

Important features of the trolley according to the present invention are a base frame on wheels, a stretcher support spaced from and above the base frame, means for raising, lowering and tilting the stretcher support relative to the base frame.

The present invention in one general form is a trolley for picking up and setting down a stretcher, said trolley comprising a base frame on wheels having a substantially horizontal side member, adjacent each end of which is secured a laterally extending support member, said base frame support members being located on one side of said base frame side member thereby providing the base frame with one open side opposite from said base frame side member, a stretcher support spaced from and above the base frame, the stretcher support having two horizontal stretcher support arms which are spaced apart and substantially parallel to one another, means for mounting the stretcher support to the base frame at a position remote from said one open side, means for raising, lowering and tilting the stretcher support relative to the base frame.

A preferred form of trolley in accordance with the invention will now be described by way of example with reference to the accompanying drawings of which:

FIG. 1 shows in perspective a general assembly of the trolley,

FIG. 2 is a sketch of the trolley showing alternative stretcher support columns and telescopic lifting rams,

FIG. 3 is a side elevation of the stretcher support and columns illustrating the elongated pivot slot, and

FIG. 4 illustrates an alternative means of supporting the stretcher support.

The trolley comprises a base 1 in the form of a framework carrying wheels 2 which rest on the ground. Along the side 3 of the base frame 1, there is provided a support 4 to which is attached at least one gas cylinder, a pressure regulator 5 and control valves 6 to control the flow to and from a pneumatic/hydraulic convertor 8. The stretcher support columns 9 and 10 are also hydraulic cylinders and a lever 11 can select operation of both cylinders simultaneously or either cylinder independently. The cylinders have internal pistons or rams 12 and 13 which are connected at their tops to a longitudinal member of the stretcher support 14 in a

manner which permits pivoting to take place at 15 and 16. In addition at pivot 15 (see FIG. 3) a sliding action is attainable so that tilting of the longitudinal member of the stretcher support can take place while the cylinders remain fixed. Two arms 17 and 18 project outwards from the ends of the member 14 to form a rest for a stretcher, the poles of which rest in recess 19. Pressure gauge 20 may be included to indicate the pneumatic and/or hydraulic pressures.

A trolley of the type described may have many usages in Hospitals, Nursing Homes and the like, particularly for the transfer of patients to and from each and any combination of bed, operating table, X-ray table, recovery room trolleys and trolleys of similar design.

Further, the trolleys may be used with advantage for transporting certain patients from bed to bathroom where washing may readily be accomplished while the patient remains on the trolley. Also it may be a prime consideration when moving very ill patients, that the patients are exposed to minimal disturbance. Therefore, in operations such as weighing a patient, a calibrated pressure gauge is incorporated in the hydraulic/pneumatic system of the trolley to allow weighing with minimal disturbance. Similar consideration is required when transferring the patient from ambulance to Emergency, and X-ray Departments. By use of the trolley, the same stretcher may be used and particularly with radio translucent stretchers, the patient can be X-rayed without moving off the stretcher or trolley. In this instance, wood or fibreglass stretcher poles may be used, and in confined spaces telescopic metal poles. Not only canvas but terylene or similar material may be used for the stretchers.

The trolley is versatile and may take the place of conventional hospital trolleys. As described in reference to FIGS. 1 and 3, the patient may be tilted as required. The support columns 9 and 10 are fixedly attached to the side 3 of the base frame 1 and the rams 12 and 13 extend coaxially from the common support columns and hydraulic cylinders. The rams are attached at their tops to the stretcher support by the pivots 15 and 16, one (15) of which is located in an elongated slot 22, so as to allow movement of the pivot point. Alternatively both pivots may be adapted to allow for such movement. Tilting in either direction is achieved by extending one ram by a greater amount relative to the other ram. The length of slot 22 may also have the effect of limiting the relative movement of the rams and prevents excessive tilt in either direction. Alternative means for limiting the tilt may be provided.

The trolley described has two hydraulic cylinders, each acting both as ram and support column. However, the stretcher support may be raised, lowered and tilted by any pneumatic, hydraulic, mechanical or electrical means or any combination and may be foot or hand operated. Pneumatic, mechanical or electrically operated rams may be used singularly or in any combination. Further, the invention is not limited to two support columns and rams, one or any number may be used.

The trolley as described in FIG. 1 is operated by one or more gas cylinders preferably containing carbon dioxide. A pressure regulator 5 to reduce the high cylinder pressure to the working pressure may be incorporated. The pneumatic/hydraulic convertor 8 may be of conventional design and converts the power available from the gas under pressure to the hydraulic liquid to power the rams 12 and 13. Controls may be incorporated to operate control valve 6 and control the gas or

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liquid to provide the up and down and tilt movements. Descent of the trolley stretcher support is affected by gravity but may be power operated.

An alternative means of supporting and moving the stretcher support relative to the base is illustrated in FIG. 4. Members 34 and 35 are attached at approximately their centre and may rotate about pivot 32. Ends 26 and 28 of members 34 and 35 respectively are pivotally attached to the side 3 of the base frame, while ends 29 and 27 are pivotally attached to the stretcher support 14. The pivots at ends 28 and 29 are allowed to slide in slots 30 and 31. The raise and lower motions may be achieved by moving pivot 28 along slot 30, alternatively, at least one hydraulic ram 25 of the type previously described may be used. Tilting of the stretcher support may be obtained by traversing pivot 32 secured to member 34 along a slot 33 formed in member 35. The above alternative means is intended to illustrate that a number of methods may be employed to obtain the raise, lower and tilt motions. It is not intended that the invention be limited to those methods described.

Trolleys in accordance with the invention may be constructed for special purposes where a greater range of lift height is required. In these circumstances, telescopic rams and support columns (Items 23 and 24, FIG. 2) may be substituted for those shown in FIG. 1.

Provision may also be made on the trolley for ancillary equipment such as: oxygen cylinders, side rails, straps to restrain restless patients, intravenous drip-support rod, document holder, drainage bottles.

I claim:

1. A trolley, for picking up and setting down a stretcher, said trolley comprising substantially a horizontal side member, adjacent each end of which and transverse thereto is secured an extending horizontal support member, said support members being located on one side of said side member to define a substantially U-shaped and horizontally disposed base frame which is movable and supported on wheels, a stretcher support spaced from and above the base frame, the stretcher support having a side member which is spaced apart and aligned substantially above the base frame side member and two substantially horizontal and laterally spaced stretcher support arms which are secured one to each end of the stretcher support side member, the stretcher support arms overhanging the base frame and being adapted to support a stretcher when it is mounted on and across the support arms, two upright hydraulic rams, each having a cylinder and a piston, the cylinders at an end remote from the pistons being fixedly secured to and adjacent each end of the base

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frame side member, the piston of each hydraulic ram being pivotally connected adjacent one end thereof to the stretcher support side member, at least one pivot of which is adapted to allow movement of the stretcher support side member with respect to the piston in a direction along the stretcher support side member, at least one high pressure gas cylinder containing a compressed gas, a pneumatic/hydraulic convertor and manual control means, whereby power available from the compressed gas can be converted to hydraulic power to raise or lower the pistons either in synchronism or relative to one another to obtain tilting of the stretcher support frame.

2. A trolley, for picking up and setting down a stretcher, said trolley comprising a substantially U-shaped and horizontally disposed base frame on wheels having a substantially horizontal side member, adjacent each end of which is secured a laterally extending support member, said base frame support members being located on one side of said base frame side member, a stretcher support spaced from and above the base frame, the stretcher support having two substantially horizontal and laterally spaced stretcher support arms, means for mounting the stretcher support on the side member of the base frame whereby a side, which is located between the stretcher support and base frame and remote from said mounting means, is open, means for raising and lowering the stretcher support arms relative to the base frame, means for raising and lowering the stretcher support arms with respect to each other to permit tilting of a stretcher supported on said support arms, said means for mounting and said means for raising, lowering and tilting the stretcher support being combined and comprising two substantially upright hydraulic rams, each having a cylinder and ram rod, the cylinders at an end remote from the ram rod being fixedly secured one to and adjacent each end of the base frame side member, the ram rods of each hydraulic ram being pivotally connected at one end thereof to the stretcher support side member, at least one pivot of which being adapted to allow movement of the stretcher support side member with respect to the ram rod in a direction along the stretcher support side member, and hydraulic control and power means permitting the rams to be raised or lowered substantially in synchronism or relative to one another to obtain tilting of the stretcher support frame, said hydraulic control and power means including a source of compressed gas and a pneumatic/hydraulic convertor, which converts the power available from the compressed gas to the hydraulic liquid to power the rams.

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