Oct. 14, 1952 S. A. WATERMAN 2,613,372

MOBILE TRANSFER DEVICE FOR A LITTER AND OPERATING TABLE

Filed June 18, 1949 2 SHEETS—SHEET 1

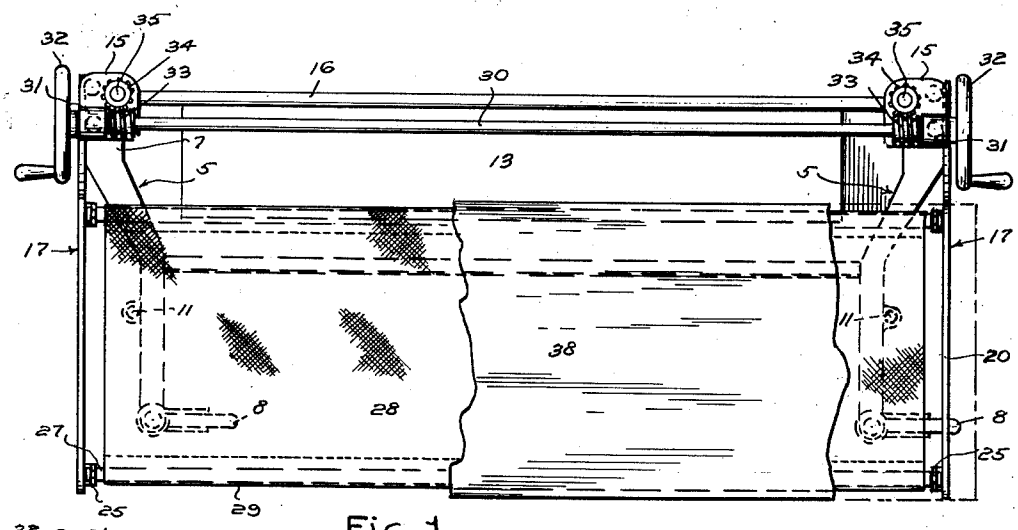


Fig. 1.

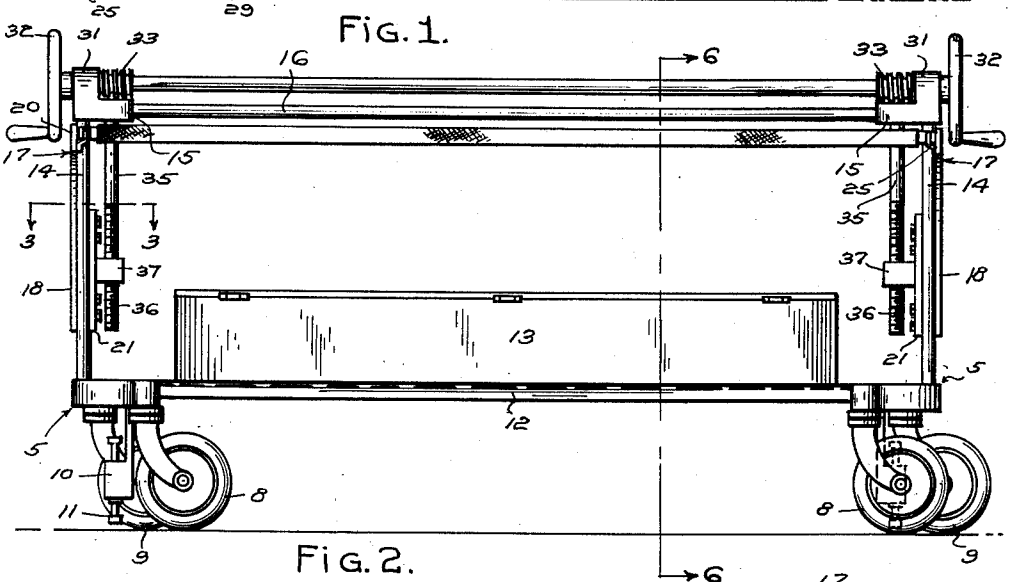


Fig. 2.

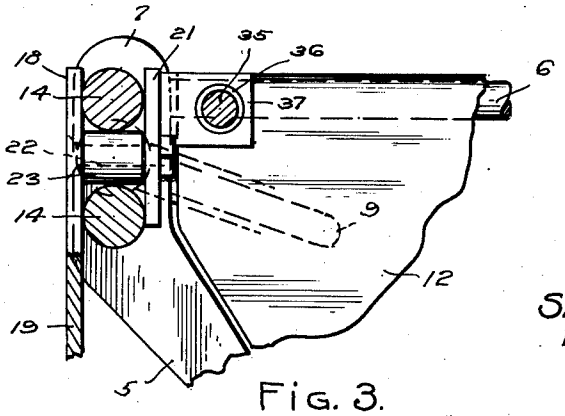


Fig. 3.

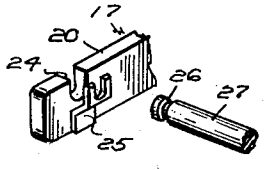


Fig. 4.

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MOBILE TRANSFER DEVICE FOR A LITTER AND OPERATING TABLE

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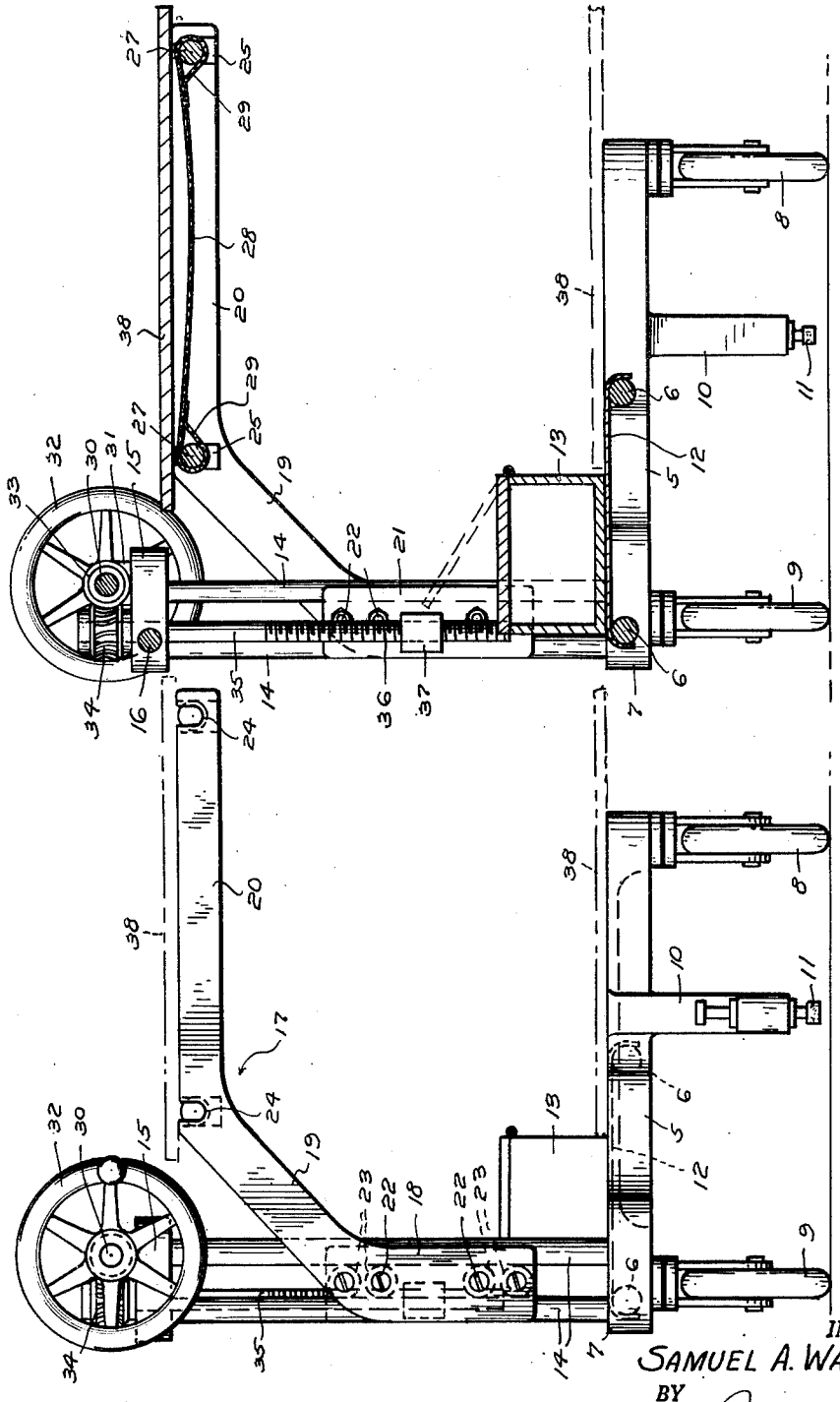


Fig. 6.

Fig. 5.

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MOBILE TRANSFER DEVICE FOR A LITTER AND OPERATING TABLE

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3 Claims. (Cl. 5—86)

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This invention relates to improvements in mobile operating tables and has particular reference to an operating table capable of being readily transferred from place to place for emergency or other operations.

It is an object of the present invention to provide a mobile operating table embodying means for easily and quickly adjusting the height of the table for convenient operating position, which may be adjusted to a height for convenient transfer of a patient from a bed, has a rigid table top that is quickly and easily removed and stored beneath the table and further, includes a flexible litter to be substituted for the rigid top when the device is to be employed as a patient transfer means.

Another object of the invention resides in the novel means for elevating or lowering the table to accommodate itself to various operating heights, is operable from either end of the table with a minimum of effort, is exceptionally convenient in removing a patient from a bed, since the device can be adjusted to bed height and rolled beneath the bed with the table or litter overlying the bed.

The structure further readily adapts itself for use in industrial plants, coal mines, factories and for first aid in hospitals, permits prompt treatment for the injured, since it can be quickly moved to the site of an accident or the like, thus greatly minimizing the danger of shock to the patient, provides storage space for first aid materials beneath the table, permits obstetrical delivery at any point in the hospital without the necessity of transferring a patient to a delivery room, is safe against accidental shifting in height due to its worm gear operating means, is quickly and easily convertible from an operating table to a litter and has for its major and outstanding purpose the performance of surgery at any remote point and the rapid and comfortable transfer of a patient.

Other important objects and advantages of the invention with respect to structural features, through the medium of which an exceptionally strong and durable device is provided that has mechanical means requiring a minimum of attention, is comparatively cheap to manufacture, is easily moved through the medium of large diameter caster wheels and is highly convenient in use.

Referring to the drawings, wherein has been illustrated a preferred embodiment of the invention and wherein like characters of reference are employed to designate like parts throughout;

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Figure 1 is a plan view of a mobile operating table constructed in accordance with the invention,

Figure 2 is a side elevation thereof,

Figure 3 is an enlarged fragmentary horizontal section, taken on line 3—3 of Figure 2,

Figure 4 is a fragmentary perspective view of an end of one elevating arm and an associated litter supporting arm,

Figure 5 is an enlarged end elevation of the table and,

Figure 6 is a transverse vertical section taken on line 6—6 of Figure 2.

Referring specifically to the drawings, the numeral 5 designates identical base frame members, horizontally arranged in spaced apart relation and rigidly tied together by preferably cylindrical horizontal bars 6. The base members 5, see particularly Figure 1, are offset inwardly toward each other from head portions 7. The offset portions of the base members are parallel to each other and are provided at their outer ends with bearings for the rotatable support of relatively large caster wheels 8. Identical caster wheels 9 are rotatably supported by the underneath part of the heads 7, as clearly shown in Figures 5 and 6. Each base member 5 is provided with a suitable bracket 10, in depending relation, adapted to support stop devices of the step-on variety, indicated generally at 11. Thus, a very rigid frame has been provided that is easily mobile through the medium of the caster wheels 8 and 9 and easily held against movement by the step-on devices 11, as desired. Supported on the bars 6, is a preferably metallic shelf 12, that extends entirely across the frame, providing an area for the support of suitable surgical equipment, preferably in a suitable chest structure 13. The bars 6 are rigidly connected with the frame members in any suitable manner against displacement.

Rigidly secured to each head 7, is a pair of spaced, vertically arranged and parallel rods 14, fixed with respect to the heads 7 against movement by suitable means. The rods 14 are of equal length and support at their upper ends, bearing blocks 15. The blocks 15 are generally square in top plan and are rigidly fixed to the rods 14. A tie rod 16 extends between the blocks 15 and has its terminal ends also rigidly fixed in the blocks. The rod 16 braces the blocks and the rods 14 against inward or outward flexing movement in use.

Mounted outwardly of the rods 14 and adapted to be shifted in a vertical plane, is a pair of

identical table or little supporting arms 17, generally flat and having a vertical supporting and guiding portion 18, an outwardly inclined portion 19 and a horizontal elongated arm section 20. The arm sections 20 are parallel and are adapted to maintain identical degrees of elevation through mechanism to be described. Backing plates 21 are arranged upon the inner sides of the rods 14. Connected between the plates 18 and 20, are short shaft sections 22, carrying antifriction rollers 23, jointly bearing upon the rods 14. Thus, the spaced apart rods 14 serve as a guide for the rollers 23, while the plates 18 and 20 are maintained in suitable clearance with the rods to permit of the supporting arms 17 being raised or lowered upon the rods 14. The spacing of the rollers 23 is sufficient to prevent binding upon the rods 14 when a load is supported on the arms 17. Each arm 20 is notched adjacent the ends of its horizontal section, as at 24, for the support of litter rods, in cases where other than the regular equipment of litter is employed. Welded or otherwise fixed to the inner sides of the arms 20 and in alignment with the notches 24, are notched brackets 25, adapted to receive the grooved end 26 of litter arms 27. This particular mounting avoids the possibility of the litter arms slipping from the supported position when any abnormal pressure is brought against the arms 20 in an outward direction. A conventional litter 28 is carried by the arms 27 through the medium of a hem on each side, as at 29.

Means are employed to elevate the arms 17 in unison, carrying with them, the litter 28 and a patient that might be supported thereon, comprising a common operating shaft 30, journalled in bearings 31, formed upon the blocks 15. The shaft extends at its opposite ends beyond the blocks 15 and carry operating hand wheels 32. The bearings 31 are provided with suitable bushings, not shown. Mounted inwardly of the bearing 31 and fixed to the shaft 30, are worms 33, having mesh with worm gears 34, fixed upon the upper ends of elevating screws 35. The screws 35 parallel the rods 14 and have a journal bearing in the blocks 15. The lower ends of the screws 35 are threaded, as at 36 and have threaded engagement with nuts 37, fixed upon the plates 21. A suitable thrust bearing is preferably employed beneath the worm gear and the block 15 to take the downward pressure that is normally exerted upon the screws 35 due to the weight of the litter supporting arms 17 and a supported patient. It will thus be seen, that when the shaft 30 is rotated from either end, motion is imparted to the screws 35 through the worm and worm gear, rotating the screw with respect to the nut 37, causing a movement in the vertical plane of the arms 17, guided by the rods 14. Thus, the arms 17 are jointly moved and locked in the adjusted position by the worm and worm gear drive.

Since this device is adapted to be used both for a mobile litter support and an operating table, it becomes necessary that a rigid table be employed when the device is to be used as an operating table. For this purpose, a rigid table top 38, shown in full lines in Figure 6, is placed in position upon the top edges of the arms 20 and supported against shifting in either direction by means not shown. The top 38, being detachable, is usually kept in supported position upon the lower frame members 5, where it is always available for emergency operations and normally remains with the device at all times as an essential part of the invention, since the device is primarily for emergency purposes, to be transferred from place to place when occasion arises.

In the use of the device, when an emergency exists, such as in a hospital, the device is transferred to the point of emergency. If the patient should be in bed, the device is wheeled to the bed and adjusted to the point where the arms 20 are just sufficiently high as to pass over the mattress. The device is then shoved forward to a point where the arms 20 overlie the bed and the base members extend under the bed. The patient is then moved onto the litter 28, or the table 38, as the case may be and any medical attention can then be performed directly, or the patient transferred to a remote point for treatment. When used as an operating table, it is particularly advantageous to have the table adjustable as to height, thus permitting a delicate adjustment most desirable to the surgeon. The device is desirable particularly in industrial plants, mines or the like, where it frequently becomes necessary to perform surgery at the location of the emergency, since frequently there is insufficient time to transport a patient to a hospital. Surgical supplies and instruments are maintained in the chest 13, properly sterilized for immediate use. Prompt surgical attention frequently avoids or greatly reduces the danger of shock to the patient caused so much by unnecessary handling in preparation for treatment. For surgical use, the device is wheeled to the patient, the table top 38 placed in position and the patient placed thereon. The table is caused to remain stationary during surgery, by the step-on devices 11.

It will be seen from the foregoing that a very novel and highly convenient mobile table and litter has been provided. The structure is very strong, quickly and easily adjustable to the desired height from either end thereof, has few parts that require a minimum of attention and is extremely desirable for all emergency medical attention.

It is to be understood, that the invention is not limited to the precise arrangement shown, but that it includes within its purview, whatever changes fairly come within either the terms or the spirit of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A mobile operating and transfer table comprising a base frame including spaced and horizontally arranged frame members, rigid bars connected to the frame members for providing a generally U-shaped open front frame, caster wheels carried at the four corners of the frame, a pair of vertically arranged and parallel rods supported by the rear ends of each frame member in spaced relation, bearing blocks rigidly attached to the upper ends of each pair of rods, a brace tie rod connecting the bearing blocks, elevating arms arranged at either end of the table outwardly of the rods, means carried by the arm for antifriction sliding engagement with the rods in a vertical plane, guide means for maintaining the arms in traverse position upon the rods, said arms each including a horizontal support, said supports being parallel with respect to each other for the detachable reception of a body supporting table, an operating shaft journalled at each end in the bearing blocks and projecting therebeyond and provided with hand wheels at each end, gear means carried by the shaft and means

controllable by the gear means and having operative connection with the guide means for imparting simultaneous vertical movement to the arms and stop means carried by the frame members for maintaining the table against shifting upon its caster wheels.

2. A mobile transfer device for the elevating support of an operating table including a base frame of general U-shape open at the front and comprising a pair of spaced end frame members each inwardly offset in parallel relation and having flat horizontal tops, rigid parallel bars connecting the frame members, each frame member provided at its rear head portion with a pair of vertically arranged spaced parallel rods, a bearing block fixed jointly upon the upper ends of each pair of rods, journal bearings formed on the blocks, a tie rod connecting the blocks, the blocks being of equal elevation above the base frame, a horizontally arranged common operating shaft journalled in the blocks and extending from end to end of the device and projecting beyond the journals, hand wheels fixed on the terminal ends of the shaft, elevating arms for the detachable support of an operating table, each said arms including a vertical leg and a horizontal leg, the vertical leg positioned outwardly of and in slidable contact with the rods, a guide plate for maintaining the vertical leg in traverse position against the rod, antifriction rollers journalled in the vertical leg and the guide plate jointly and shiftable vertically between the rods, and gearing operable by the shaft from either end of the table and having connection with the guide plates for moving the arms simultaneously in a vertical plane for elevating or lowering the operating table, caster wheels for supporting the frame in a mobile manner and step-on stop devices carried by each frame member for immobilizing the device.

3. A mobile elevating transfer device for an operating table comprising a base frame including a pair of inwardly offset spaced end frame members having head portions and flat horizontally arranged tops, ground engaging caster wheels rotatably supported at either end of the frame members, a pair of spaced vertically arranged rods fixed upon the head portions of each frame member, journal bearing blocks carried

jointly upon the upper ends of each pair of rods, a tie rod rigidly connecting the blocks, elevating arms for the detachable support of an operating table, said arms each including a vertical and a horizontal leg portion, the vertical leg of each arm positioned against and upon the outer side of the rods and of a width to overlie the rods of each pair, a guide plate arranged upon the inner side of each pair of rods and being of a width to overlie the rods of each pair, pairs of antifriction rollers positioned between the rods of each pair and adapted to traverse the space between the rods, shafts connected with each vertical leg portion and corresponding plate jointly for the rotatable support of the rollers, a threaded nut carried by each guide plate and extended inwardly of the frame, screw devices vertically arranged and having their lower portions threaded to engage a nut carried by each of the guide plates, said screw devices having their upper ends journalled in the blocks and projecting above the blocks, worm gears carried by the upper ends of the screws above the blocks, a common operating shaft extending from end to end of the table and journalled in the blocks, the shaft extending beyond the blocks at either end and provided with hand wheels fixed at the terminal ends thereof, worms fixed upon the shaft in meshing engagement with the worm gears, the horizontal leg of each arm provided with spaced notched brackets for the support of a pair of horizontally arranged rods, parallel bars for maintaining the frame members in rigid spaced relation, and stop devices for immobilizing the transfer device.

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