Feb. 27, 1945. J. W. LEWIS 2,370,251

ORTHOPEDIC ARCH

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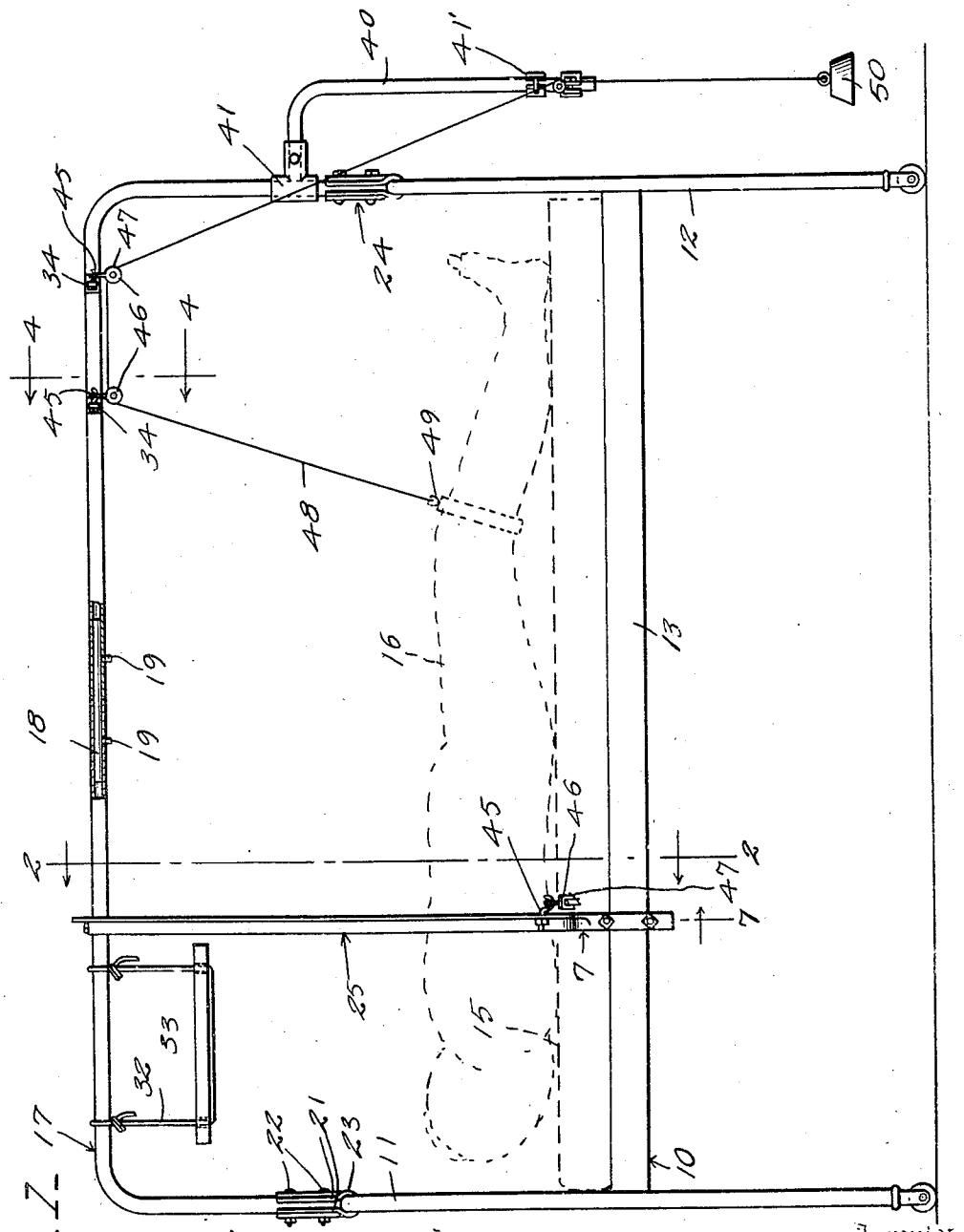


FIG. 1.

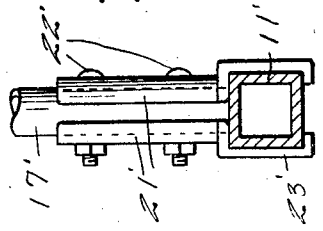


FIG. 2.

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Fig. 6.

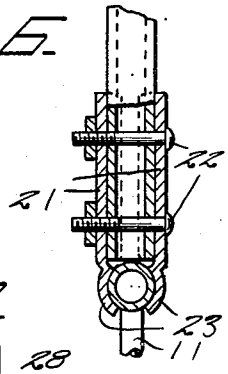


Fig. 2.

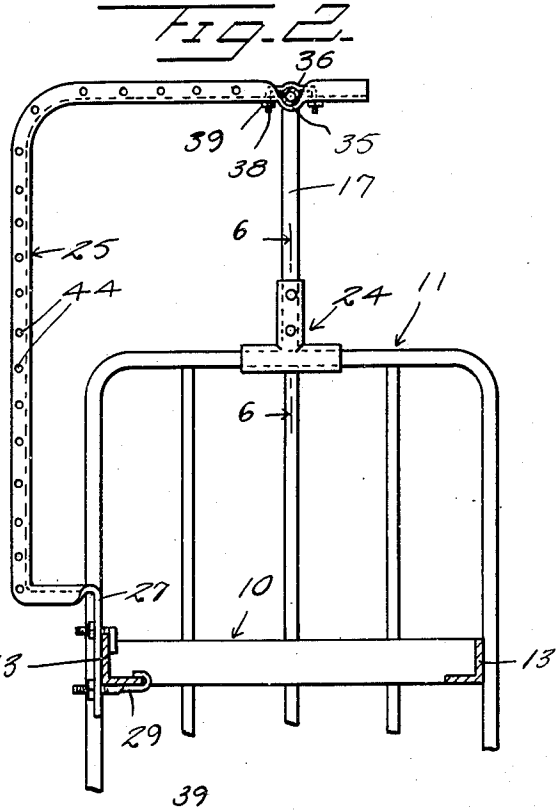


Fig. 7.

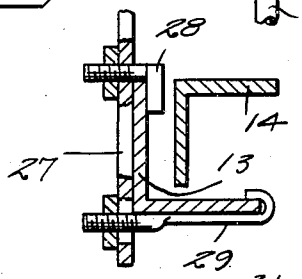


Fig. 8.

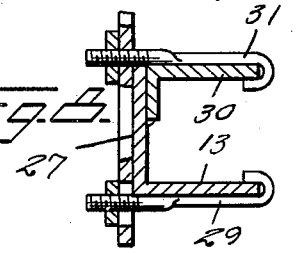


Fig. 4.

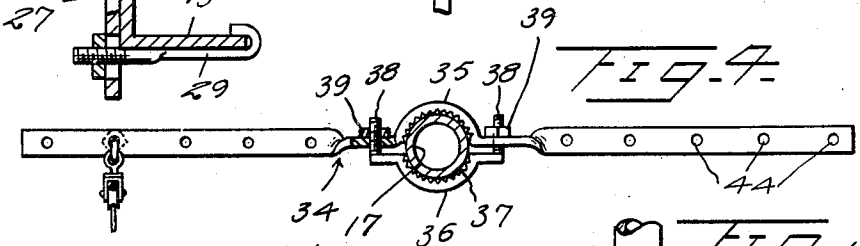


Fig. 3.

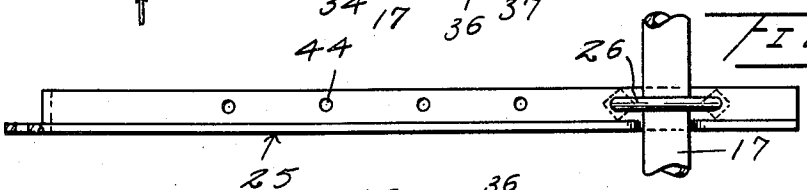
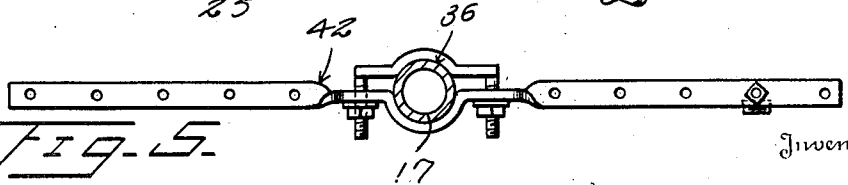


Fig. 5.



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UNITED STATES PATENT OFFICE

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ORTHOPEDIC ARCH

Jack W. Lewis, Tyler, Tex.

Application July 29, 1943, Serial No. 496,625

6 Claims. (Cl. 5—92)

This invention relates to an orthopedic arch, and it aims to provide a structure in the nature of an attachment for a bed to facilitate the treatment of broken bones and paralysis, for example, by subjecting the same to the action of suspended weight.

It is particularly aimed to provide a structure which is readily attachable and detachable, which is simple, inexpensive, and may be adapted rapidly to the patient, a structure which will eliminate hazards in case of fire, and will permit removal of the bed with the attachment in place and the patient in bed as from room to room or on elevators in a hospital.

The more specific objects and advantages will become apparent from a consideration of the description following taken in connection with accompanying drawings illustrating an operative embodiment.

In said drawings:

Figure 1 is a view in side elevation of a conventional bed equipped with my improvement;

Figure 2 is a vertical section taken on the line 2—2 of Figure 1;

Figure 3 is a plan view of the transverse arch;

Figure 4 is a vertical section taken on the line 4—4 of Figure 1;

Figure 5 is a view similar to Figure 4 but employing a modified form of cross bar;

Figure 6 is a vertical sectional view taken on the line 6—6 of Figure 2;

Figure 7 is a vertical section taken on the line 7—7 of Figure 1;

Figure 8 is a vertical section corresponding to Figure 7, but taken through a modified form; and

Figure 9 is a detail similar to Figure 6, but taken through a modified form.

Referring specifically to the drawings wherein like reference characters designate like or similar parts, 10 represents a conventional metal bedstead having a head frame at 11, a foot frame at 12, and side bars 13 connecting the head and foot frames. The bed may include a spring frame 14 of conventional structure adapted for removal as usual and to support a mattress and bed clothing as at 15 to enable a patient as suggested at 16 to rest thereon.

In carrying out my invention I employ a preferably centrally disposed longitudinally extending arch 17 which is adjustable as to length to enable use on beds of different sizes. Specifically, the longitudinal arch 17 is tubular and is centrally divided into sections joined together by a splice pin 18 and held in adjusted position by set screws 19 carried by the adjacent ends of the sections.

At the head end of the bed, the longitudinal arch 17 may be secured detachably thereto by means of clamp plates 21 in combination with bolts 22 passing therethrough and through the arch, which clamping plates have curved jaws at 23 to engage an adjacent part of the head frame at 11. A clamping device similar to that used at 21—22—23 is employed as at 24, to secure the longitudinal arch to the foot frame 12.

I also employ a transverse arch generally designated 25 and preferably of angle iron material in cross section. This arch 25 at the top is adapted to be rigidly secured to the longitudinal arch 17 as by means of a U bolt or clamp 26 adjustably carried by the transverse arch.

Said transverse arch has an angular portion adjacent the lower end designated 27 adapted to bear against the outer surface of one of the side rails 13 and to be rigidly clamped thereto as by means of adjustable hook bolts 28 and 29. It will be noted from Figure 7 that when the hook bolts 28 are used they do not interfere with the fitting of the spring frame 14 to the bed in the usual manner. In some instances a bracket 30 is fitted onto the side rail 13 in which event the hook bolts 28 are replaced by hook bolts 31 identical in construction with that used at 29.

Suspended by a flexible cord, cable, or the like 32 from the longitudinal arch between the transverse arch 25 and the head of the bed is a hand bar 33. Such bar is positioned for grasping by a patient in exercising, moving around, or the like.

The longitudinal arch 17, adjacent the foot frame 12, is adapted removably and adjustably to mount one or more, preferably a plurality, of cross bars such as are disclosed at 34. Bars 34 have central arched portions 35 opposed to removable clamp saddles 36, so that the longitudinal arch may be grasped jointly between them, and such parts 35 optionally may have serrations 37 on their inner surfaces to direct engagement with the bar to minimize danger of slippage. The saddle clamps 36 have end bolts 38 which pass through the bars 34 and have clamping nuts 39 screw-threaded thereon.

A generally L-shaped depending extension bar is provided at 40, secured by any suitable type of adjustable clamp 41 to the longitudinal arch. Adjacent the lower end of the extension bar 40 one or more cross bars 41' are provided. Such cross bars 41' may be identical with that disclosed in Figure 4.

If desired the cross bar of Figure 4 may be replaced on both the longitudinal arch and at 41' by the modified form of cross bar disclosed in Figure 5. The modified form of cross bar is designated 42 and is identical with that of Figure 4 with the exception of the omission of serrations 37 and the use of the saddle clamp 36 uppermost rather than lowermost as in Figure 4. The other reference characters correspond to those used in the preceding figures.

Attention is called to the fact that in cases where the clamps which secure the longitudinal arch in place engage head frames and foot frames having parts rectangular in cross section as at 11' in Figure 9, the clamp plates will be correspondingly shaped. For instance, as shown in Figure 9, the section of the longitudinal arch is shown at 17' engaged by clamp plates 21' in combination with bolts 22' passing through the plates and arch. Those portions which grip the head or foot frames are of U shape as shown at 23'.

Attention is called to the fact that at frequent intervals throughout the length of the transverse arch 25 and the cross bars 34, 41' and 42, openings 44 are provided therethrough. Such openings enable ready attachment and detachment of conventional hooks 45 which detachably suspend pulley blocks 46 carrying pulleys 47, the latter being mounted for swivel movement. Over the pulleys 47 flexible elements 48 are adapted to be trained, and at one end as at 49 to be connected to a limb or part of the body of a patient requiring treatment, at the other end suspending one or more weights as at 50.

With such a structure the elements 48 and weights 50 may be mounted at various locations most advantageous to the patient, and it is to be borne in mind that the bed as a whole may be moved about a hospital from room to ward or vice versa, into sunparlors, onto elevators and the like, through doorways, without dismantling any of the apparatus.

I claim as my invention:

1. An attachment of the class described comprising a rigid longitudinal element adapted for attachment to a bedstead in elevated position above the bed and supported upon the head and footmembers, a transverse element attachable to the bedstead and to the first element, and means to mount pulleys carried by the first element, the pulleys functioning to train weighted flexible elements with means adapted to be attached to a patient.

2. An attachment of the class described comprising a rigid longitudinal element adapted for attachment to a bedstead in elevated position above the bed and supported upon the head and footmembers, a transverse element attachable to the bedstead and to the first element, and means to mount pulleys carried by the first element, the pulleys functioning to train weighted flexible elements with means adapted to be attached to a patient, said first element consisting of a longitudinal arch, and means operable to adjust the length of the arch.

3. An attachment of the class described comprising a rigid longitudinal element adapted for attachment to a bedstead in elevated position above the bed and supported upon the head and footmembers, a transverse element attachable to the bedstead and to the first element, and means to mount pulleys carried by the first element, the pulleys functioning to train weighted flexible elements with means adapted to be attached to a patient, said first element being a longitudinal arch, the transverse element being an arch, clamp means securing the arches together, and clamp means to secure the transverse arch to a bed frame.

4. An attachment of the class described comprising a rigid longitudinal element adapted for attachment to a bedstead in elevated position above the bed and supported upon the head and footmembers, a transverse element attachable to the bedstead and to the first element, and means to mount pulleys carried by the first element, the pulleys functioning to train weighted flexible elements with means adapted to be attached to a patient, said first element being a longitudinal arch, the transverse element being an arch, clamp means securing the arches together, and clamp means to secure the transverse arch to a bed frame, means to mount the pulleys comprising bars supported by the longitudinal arch.

5. An attachment of the class described comprising a rigid longitudinal element adapted for attachment to a bedstead in elevated position above the bed and supported upon the head and footmembers, a transverse element attachable to the bedstead and to the first element, and means to mount pulleys carried by the first element, the pulleys functioning to train weighted flexible elements with means adapted to be attached to a patient, said first element being a longitudinal arch, the transverse element being an arch, clamp means securing the arches together, and clamp means to secure the transverse arch to a bed frame, means to mount the pulleys comprising bars supported by the longitudinal arch, an extension on the longitudinal arch, and said extension mounting one of said bars.

6. An attachment of the class described comprising a rigid longitudinal element adapted for attachment to a bedstead in elevated position above the bed and supported upon the head and footmembers, a transverse element attachable to the bedstead and to the first element, and means to mount pulleys carried by the first element, the pulleys functioning to train weighted flexible elements with means adapted to be attached to a patient, said first element being a longitudinal arch, the transverse element being an arch, clamp means securing the arches together, and clamp means to secure the transverse arch to a bed frame, means to mount the pulleys comprising bars supported by the longitudinal arch, an extension on the longitudinal arch, and said extension mounting one of said bars, said transverse arch and said bars having relatively close openings to facilitate the adjustable mounting and variable positioning of the pulleys.

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