Sept. 1, 1931. E. A. HAMLIN 1,821,435

SURGICAL APPARATUS

Filed May 4, 1929

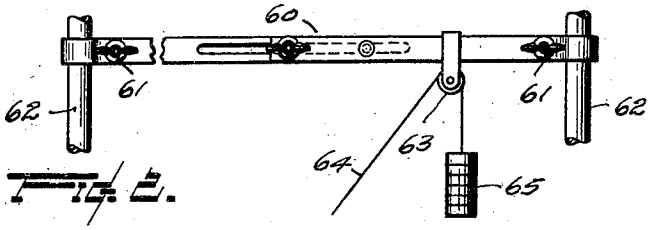


FIG. 2.

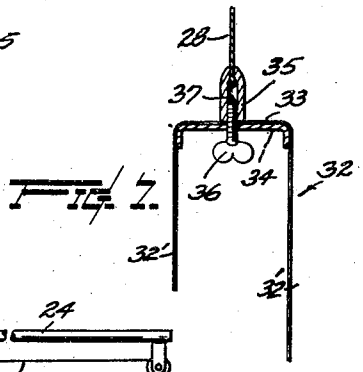


FIG. 7.

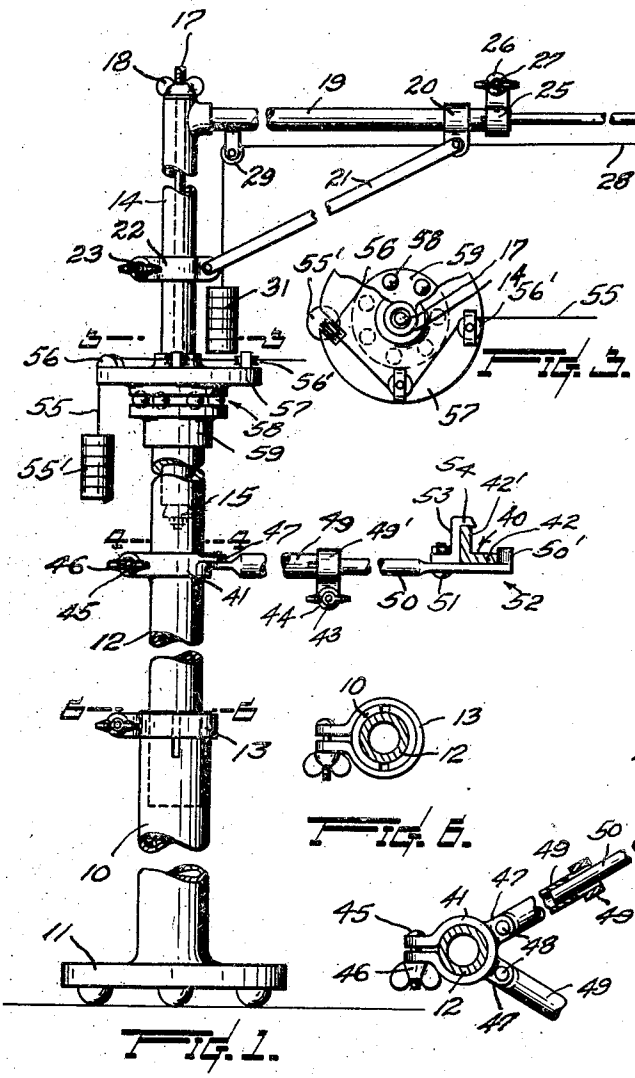


FIG. 3.

FIG. 6.

FIG. 1.

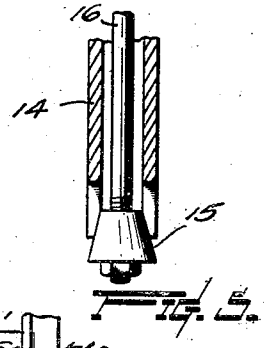


FIG. 5.

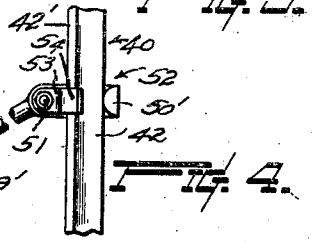


FIG. 4.

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UNITED STATES PATENT OFFICE

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SURGICAL APPARATUS

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This invention relates to hospital apparatus, and its object is to provide improved devices for use in hospitals and the like for imparting stretching stresses to an arm or leg of a patient to a straighten or elongate the same.

Another object is to provide portable devices of this character which may be conveniently shifted by a nurse and adjustable to most advantageously meet the requirements of the patient.

Another object is to provide a portable limb supporting and stretching apparatus which will be of simple, inexpensive construction, which will be strong and durable with a minimum of weight, and peculiarly efficient in the accomplishment of its various functions.

With these ends in view, the invention consists in the novel construction, adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawings,—

Figure 1 is a view in side elevation of an embodiment of the invention, with parts broken away and illustrated connected to a bed-rail which is shown in transverse vertical section; Fig. 2 is a fragmentary transverse elevation showing portions of bed-posts and with attachments for shoulder supporting devices; Figs. 3 and 4 are horizontal detail sections taken substantially on lines 3—3 and 4—4 of Fig. 1; Fig. 5 is a vertical transverse sectional view of post clamping means; Fig. 6 is a horizontal section on line 6—6 of Fig. 1; and Fig. 7 is an elevational-sectional view of portions of adjustable arm-suspending devices adapted for use with the present invention.

In said drawings, the reference numeral 10 represents the lower tubular member of a stand having a relatively large base 11.

Extending telescopically into said lower member is an upper tubular member 12 which is adapted to be secured to the lower member for holding the former at an adjusted elevation by means of a ring clamp 13 surrounding the slotted upper end of the stand member 10. Extending downwardly into the upper member 12 of the stand is a tubular post 14 which is adapted to be secured to the member 12 at adjusted elevations and in selected rotary positions by means of coupling devices illustrated in Figs. 1 and 5.

As shown, said coupling devices comprise a conical body 15 secured to the lower end of a rod 16 and engaging in the slotted lower end of the post 14. The upper end of said rod is screw threaded as at 17 for engagement with the threads of a winged nut 18. For regulating the post 14, as to height and relative rotary positions, the nut 18 is first loosened upon the rod and secured thereto subsequent to the adjustment of the post with respect to the stand.

Rigid with the post 14 adjacent its upper end and extending horizontally therefrom is a tubular arm part 19 carrying near its outer end a clip 20 to which the upper end of a brace 21 is secured, the lower end of the brace being adjustably secured to the post by means of a collar 22 which is releasably connected to the post as by means of a clamping screw 23. Slidable axially within said arm part 19 is a complementary arm part 24 which is adjustably connected to the other part by means of a clamping collar 25 surrounding the slotted outer end of the arm part 19 and actuated by a winged nut 26 taking on a screw threaded clamping bolt 27.

The function of the arm 19—24 is to carry a flexible cable, denoted by 28, for substantially the entire length of the arm, said cable passing about guide pulleys 29 and 30 depending from opposite ends of the arm.

Connected to the inner and outer ends, respectively, of said cable is a heavy weight 31 and a suitable known means, such as a sling for example, whereby a person's limb (not shown) may be supported or stretched, as required in his treatment. For use as a hand or fore-arm support the above referred to sling may consist of a strip 32 (Fig. 7) of adhesive tape, or an equivalent, extending, as a loop 33, over a yoke 34, the pendant ends 32^1 of the strip being secured to the patient as when lying upon a bed. The yoke 34 is secured to an internally screw threaded thimble 35 by means of a thumb screw 36 extending thereinto.

The outer end of the cable — being thus adjustably connected to the thimble permits of convenient adjustment for regulating the elevation of the tape supported yoke through the instrumentality of said thumb screw 36 with respect to the thimble.

To facilitate assembling the sling connections above described, the thumb screw 36 is provided with an acute pointed end 37 to penetrate the tape fabric and thus secure the latter against displacement with respect to the yoke.

For use, the stand is secured against horizontal displacement to a side, or end, rail as 40 of a bedstead by means such as illustrated in Figs. 1 and 4.

More specifically, said means comprise a collar attachment 41 for engaging about the stand member 12 at an elevation governed by the height of the bed rail 40, said collar attachment being secured to the stand by means, preferably, of a clamping bolt 45 and nut 46. The collar 41 is formed to provide lugs 47 which are apertured to receive pivot bolts 48 for connecting the lugs to horizontally disposed hollow members 49 within which are sleeved ends of complementary bar members 50 whose other ends are pivotally connected by bolts 51 to rail clamps such as 52.

The sleeve and bar members 49—50 are arranged horizontally in angular relation with each other and constitute braces for securing the stand in vertical position firmly to the bedstead.

The parts 49 and 50 of said braces are telescopically adjustable and are secured in adjusted relation by the provision of a contractile collar 49^1 provided on a slotted end of the respective brace member 49 and regulated by a clamping bolt 43 and nut 44.

In its preferred construction. a bed-rail clamp 52 is formed by providing a hook shaped end 50^1 to a brace part 50 engageable with one flange 42 of the bed-rail to cooperate with an attachment 53 secured to a brace part 50 by means of the bolt 51, the attachment 53 having a hook element 54 engaging over the other flange 42^1 of the rail.

Provided in the invention is a second cable 55 connected at one end to a heavy body 55^1 and thence passing over or about guide pulleys 56, 56^1 to have its free end connected to an arm or leg of the patient as by means of devices including adhesive tape or an equivalent attaching means as explained above with reference to Figs. 1 and 7. As shown, the guide pulleys 56, 56^1 are supported upon a table 57 turnable about the axis of the stand, the weight or body 55^1 being located to have the cable extend onto and from the table at opposite sides thereof so that the effective pull through the cable will be applied diametrically of the stand.

As shown, the table is mounted upon bearing balls 58 which, in turn, are supported by a bracket 59 movable with the upper member 12 of the stand for vertical adjustments.

The weight 55^1, the cable 55 and the guide pulleys 56, 56^1 are utilized to exert a pull horizontally, or nearly so, upon the patient and is especially useful for arm stretching and straightening operations.

In Fig. 2 I illustrate devices for shoulder treatments, such devices comprising a horizontally adjustable beam 60 having its ends detachably connected by means of clamping screws 61 to the posts 62 of a bedstead, the beam serving as a support for a pulley 63 depending therefrom for a third cable 64. 65 represents a heavy body connected to one end of the cable, the other end of which may be secured by adhesive tape or the like (not shown) to a shoulder or other part of a person's body, which is to be pulled upwardly.

The construction of the invention in its preferred form and the manner of its operation will, it is thought, be understood from the foregoing description.

What I claim is,—

1. In apparatus of the character described, the combination with a stand member, and a post telescopically connected and arranged for vertical adjustments with respect to said stand, of a table mounted on said post and arranged for rotary movement about the axis of said post, said table providing pulleys through which a flexible member adapted for attachment to parts of a person's body in applying horizontal stresses thereto is arranged to pass, a weight suspended from the free end of said flexible member for affording said stress, said pulleys being disposed such as to afford a radial pull of the flexible member from said post.

2. In apparatus of the character described, the combination with a stand member, and a post arranged for vertical adjustments with respect to said stand, of a table mounted on said post and arranged for rotary movement about the axis of said post, said table providing pulleys through which a flexible member adapted for attachment to parts of a person's body in applying horizontal stresses thereto is arranged to pass, a weight suspended from the free end of said flexible member for affording said stress, said pulleys being disposed such as to afford a radial pull of the flexible member from said post.

Signed at Seattle, Washington, this 22nd day of April, 1929.

ELMER A. HAMLIN.