July 20, 1954 G. A. YOUMANS 2,684,109

EXERCISING AND TRAINING APPARATUS

Filed July 10, 1951 2 Sheets-Sheet 1

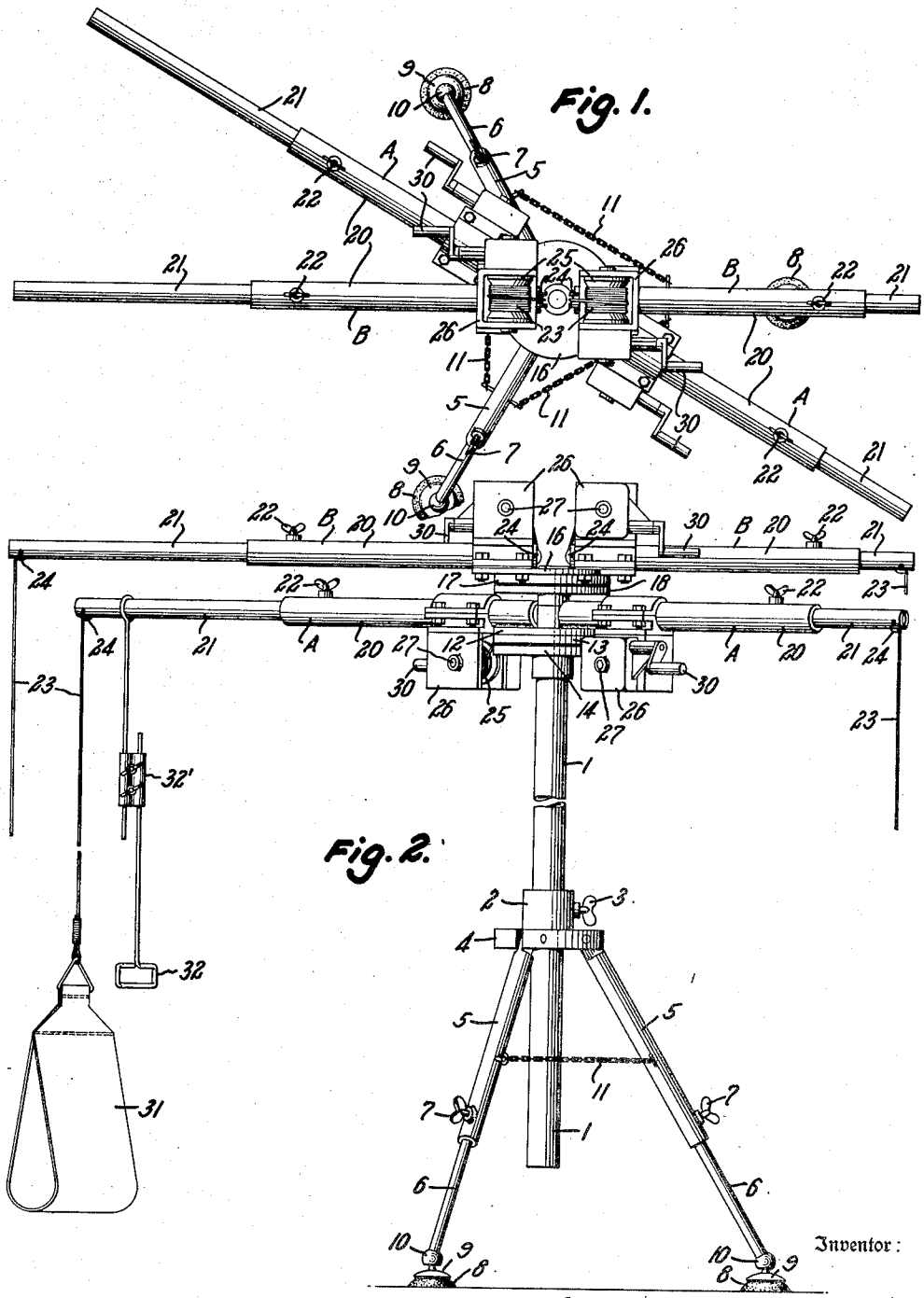


Fig. 1.

Fig. 2.

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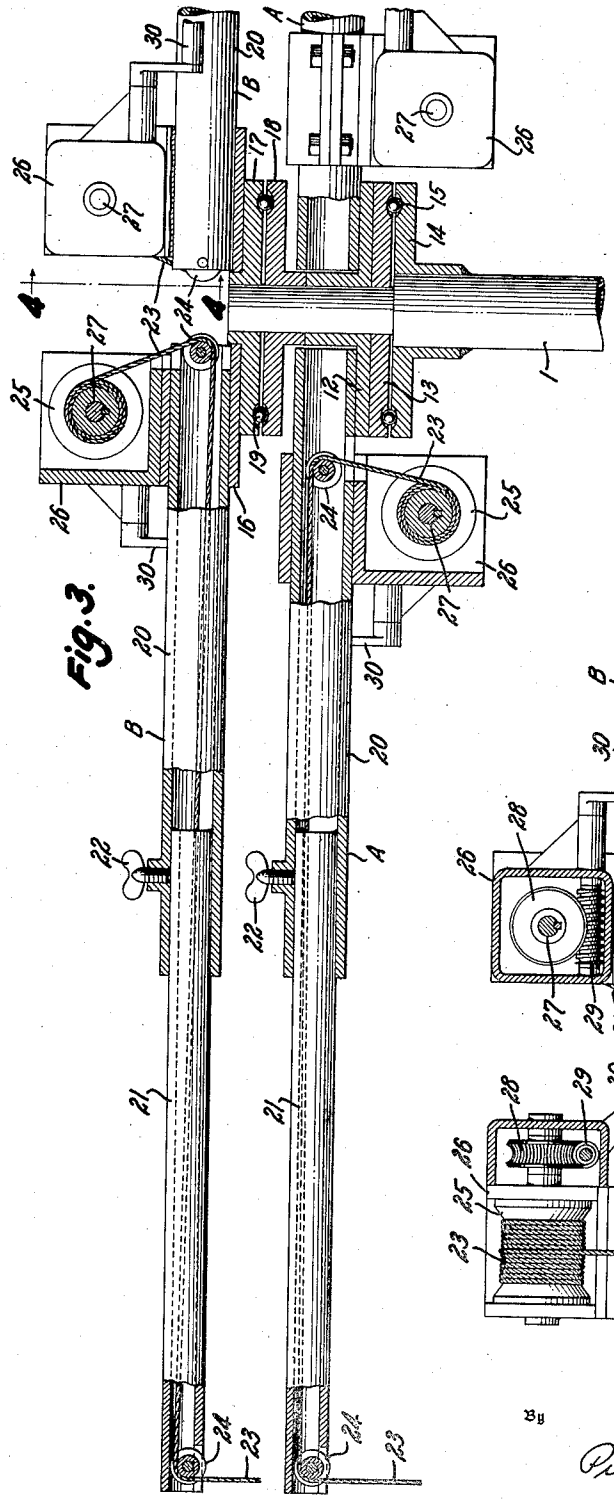


Fig. 3.

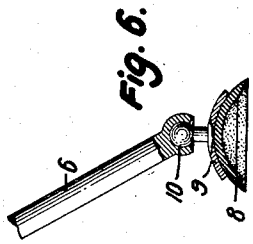


Fig. 6.

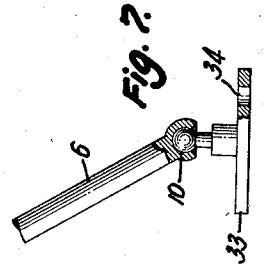


Fig. 7.

Fig. 5.

Fig. 4.

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UNITED STATES PATENT OFFICE

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EXERCISING AND TRAINING APPARATUS

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3 Claims. (Cl. 155—23)

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This invention relates to exercising and training apparatus, and particularly to apparatus in the nature of a supporting standard, one or more radial arms rotatable about the axis of the standard, and flexible cables of adjustable length depending from the arm or arms for supporting a patient during exercise or hydro-therapy treatments, or a student skater or swimmer.

It is well known that many patients recovering from poliomyelitis and broken legs, and amputees fitted with artificial legs, are reluctant to exercise as they fear a fall and consequent injury. The so-called "walkers" do afford a feeling of security but such equipment is of limited utility and, at least in the early stages, a separate nurse or orderly should attend each patient. Similarly, a separate attendant is customary for each one or two patients in hydro-therapy. In the sports field, the instruction of a group in skating, riding and swimming frequently proceeds at a slow rate as many beginners feel insecure and will practice only under the direct attention and care of the instructor.

Objects of the invention are to provide exercising and training apparatus for use by a number of individuals and which is adjustable for the optimum treatment or training of each of the individuals. Objects are to provide exercising and training apparatus including a vertical standard and at least one radial arm rotatable about the axis of the standard, the arm being of adjustable length and provided with a cable of adjustable length to which may be attached a sling or other harness for supporting a desired fraction of the weight of a patient or trainee. More specifically, an object is to provide an exercising and training apparatus including a vertical standard which, if desired may be portable, and a plurality of sets of radial arms rotatable about the axis of the standard, the arms being of adjustable length and provided with cables of adjustable length to which may be attached a sling or harness for supporting a patient or trainee.

These and other objects and the advantages of the invention will be apparent from the following specification when taken with the accompanying drawings, in which:

Fig. 1 is a plan view of an exercising and training apparatus embodying the invention;

Fig. 2 is a side elevation of the same;

Fig. 3 is a fragmentary side elevation on a larger scale, and with parts in central vertical section, of the upper end of the standard and the rotatable radial arms;

Fig. 4 is a fragmentary sectional view, on the

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plane indicated by section line 4—4 of Fig. 3, and showing one of the cable reels in end elevation;

Fig. 5 is a similar and fragmentary sectional view of a cable reel and associated parts as seen from the right of Fig. 4; and

Figs. 6 and 7 are fragmentary views, partly in section, showing alternative constructions for the tripod feet for supporting the standard.

In the drawings, the reference numeral 1 identifies a standard or column which is vertically adjustable in a supporting sleeve 2 and may be locked in a desired adjusted position by any appropriate clamping means such as the illustrated set screw 3. The sleeve 2 may be set in the floor in the case of a permanent installation or, as illustrated, may be carried by tripod legs pivoted to a collar 4 integral with the sleeve 2 and each comprising an upper tubular section 5 and a lower rod section 6 which is telescoped into its tube section and secured in desired adjustment therein by a set screw 7. As illustrated in Figs. 1, 2 and 6, the apparatus is portable and adapted to be secured to the floor of a room or of a swimming pool by suction cups 8 fixed to arcuate plates 9 which are connected to the tripod leg sections 6 by ball-and-socket joints 10. The telescoped legs and ball-and-socket joints permit a vertical arrangement of the standard 1 when the apparatus is supported on the bottom of a swimming pool or hydro-therapy tank which, in general, have sloping floors. Chains 11 are connected between the tube sections 5 of the tripod legs to limit their relative angular displacement and thus facilitate the setting of the tripod support.

A plurality of sets of radial arms A, A and B, B are supported upon the upper end of the standard 1 for individual rotation about the axis of the standard. Arms A are welded to and supported by the radial flange of a sleeve 12 which is journalled on the standard 1 and rests upon, and may be welded to, the upper grooved plate 13 of a ball bearing assembly which includes a lower grooved plate 14 welded to the standard 1 and a set of balls 15. The radial arms B are similarly welded to an annular plate 16 resting on and/or welded to the upper grooved plate 17 of a ball bearing assembly including a lower grooved plate 18 and balls 19.

The several radial arms are preferably of identical construction and include an inner tubular section 20 and an outer telescoped tubular section 21 which is anchored in desired position with respect to the inner section by a set screw 22. A flexible cable 23 extends through each radial

arm and passes over a pulley 24 at the outer end of each arm section 21. The inner end of each cable is wound upon a reel or drum 25 journalled in a housing 26 secured to the inner end of the associated radial arm. The shaft 27 of each drum 25 has secured thereto the gear 28 of a non-reversible worm and gear drive which includes a worm 29 operable manually by a crank arm 30.

At their outer end, the cables 23 are each provided with a sling or harness 31 of appropriate type by which a patient or trainee may be supported to a desired degree from the exercising and training apparatus. Auxiliary supports such as the illustrated loop 32, Fig. 2, may be suspended from one or more of the radial arms. The loops may be used as hand grips, or head rests for helpless polio patients may be attached to the loops. The auxiliary supports are suspended from the arms by any convenient means, such as the illustrated light rods telescoped into a split rod clamp 32', which affords an adjustment of the height or level of the auxiliary support.

The telescoping adjustment of the lengths of the several radial arms, and the adjustments of the effective lengths of the supporting cables 23 go to the essence of the invention as they provide an individual adjustment of the apparatus for each of the patients or trainees. The cables 23 are each adjusted to such a length that the individual patients or trainees can not fall if they should stumble or lose their footing during walking exercises, and the effective cable lengths may be such that the cables carry desired fractions of the weights of the individual patients or trainees. The lower set of arms A are preferably employed with the patients who require or who should take less exercise, and the effective lengths of the arms are shortened so that the patients will travel around a relatively small diameter circular path. For hydro-therapy and for swimming instructions, the lengths of the cables may be adjusted to afford a desired degree of buoyancy for each individual. Other hospital uses of the apparatus are the transfer of patients from beds to wheelchairs or other beds, and the support of amputees for the fitting of artificial legs.

The apparatus as above described is portable and may be moved from point to point as desired. For a fixed mounting of the apparatus, Fig. 7, the universal joints 10 of the tripod leg members 6 may be carried by anchor plates 33 having openings 34 through which bolts may be passed to secure the apparatus to a floor or other supporting base.

It is to be understood that the invention is not limited to the particular apparatus as herein illustrated and described since various modifications which may occur to others fall within the spirit and scope of the invention as set forth in the following claims.

I claim:

1. In exercising and training apparatus adapted for adjustment to provide individual support for a number of trainees for travel along non-coincident substantially circular paths, a vertical standard and base means supporting the same, two sets of opposed radial supporting arms, bearing means mounting each of said sets of arms upon the upper end of the standard for individual rotation in either direction about the axis of said standard in vertically spaced horizontal planes, each of said arms including telescoped sections and means for securing the same rigidly to each other in desired extended conditions which may be different for each arm, an idler pulley at the outer end of each outer arm section, a cable reel carried by each inner arm section, a non-reversing worm and gear for driving each cable reel, a cable wound on each reel and having an outer end extending over the pulley of the associated radial supporting arm, and means at the outer end of each cable for the support of a trainee.

2. In exercising and training apparatus, the invention as recited in claim 1, wherein said standard supporting means comprises a tripod having legs of adjustable length for supporting said standard upon a non-level surface.

3. In exercising and training apparatus, the invention as recited in claim 2, wherein each tripod leg terminates in a suction cup secured thereto by a ball-and-socket joint.

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