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APPARATUS FOR LIMB REEDUCATION

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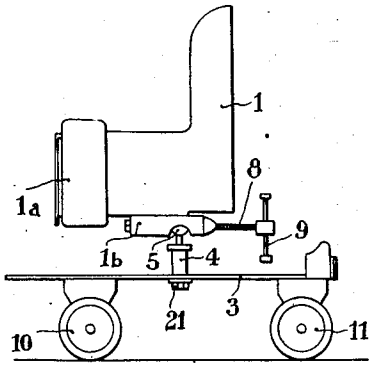



Fig.1

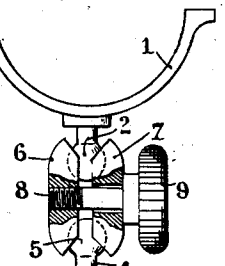
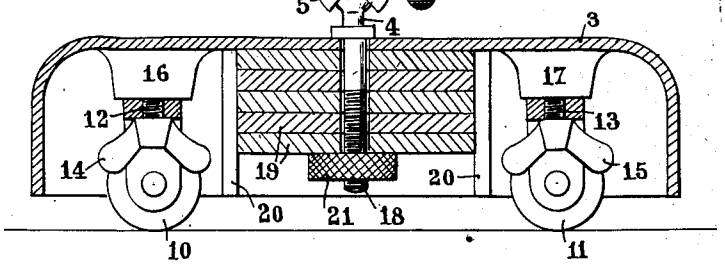



Fig. 2



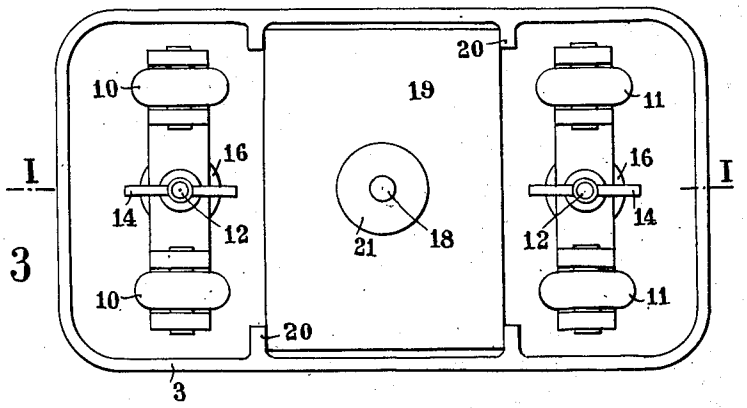




Fig. 3

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## APPARATUS FOR LIMB REEDUCATION

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5 Claims. (Cl. 272—57)

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The invention relates to an apparatus for re-education of limbs, especially those of poliomyelitic and traumatized patients.

The primary object of the invention is to provide an apparatus which allows, by suppressing the weight and friction of the limbs, to practise active mechanotherapy, to act electively on all the muscles of the limbs whatever their insertions, their directions and their functions.

Another object is to allow ensurance of great progressiveness in the resistance opposed to the patient's movements, which is an essential condition of re-education.

According to the invention, the apparatus comprises a cradle for reception of the limb or limb-segment to be re-educated, which cradle which can be turned in any direction on a knee-piece provided at the top of a substantially vertical rod the foot of which is fitted onto a carriage intended to roll on a fixed table.

In the further disclosure of the invention reference is made to the annexed drawings in which like reference numbers designate like parts in all three figures.

Fig. 1 represents diagrammatically in lateral elevation, a first embodiment, more especially intended to illustrate the principle of the invention;

Fig. 2 is a sectional-elevation, taken on the line I—I of Fig. 3, of an improved embodiment;

Fig. 3 is a plan of the apparatus according to Fig. 2, seen from underneath.

The apparatus according to Fig. 1 is constituted by a cradle 1, bent at a right angle, in which the patient's limb (hand or foot) comes to rest and is maintained by a flexible and elastic band 1a. This cradle comprises at its under part a shell 1b, by which it bears upon a ball 5 at the top of a vertical rod 4, which is fixed by its foot, by means of a nut 21, onto the frame of a carriage 3, having two sets of two wheels 10 and 11 and similar to a roller-skate.

The cradle 1 is free to turn in any direction of space, and in order to allow its fixation in such or such position, the shell 1b can be locked on the ball 5 by means of a screw 8, workable by means of a lever 9.

The manner of operation of the apparatus is readily understood and does not need to be described.

The apparatus according to Figs. 2 and 3 comprises, with regard to the first, the following main improvements:

Each set of wheels is pivoted around a vertical spindle which enables each set to take on

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the progressive setting desired by the practitioner; each set can be locked, in such a way that the arc described can be exactly that which is desirable, and can be maintained constant during a whole period of re-education, be modified at the following period, and so on; the total weight of the apparatus, which constitutes an element of re-education since it conditions in part the muscular effort to be exerted by the patient, is rendered adjustable.

In these figures, 1 designates the cradle for reception of the limb. This cradle is provided at its under part with a ball 2, thanks to which it can take any setting, in any direction with reference to the skate or supporting carriage 3. To this end the fixed rod 4 of said carriage is also terminated by a ball 5, and both balls 2 and 5 are fitted into corresponding spherical sockets of two opposite shells or jaws 6 and 7, these being capable of being tightened on said balls, in any position of the latter, by a strong screw 8, workable by means of a hand wheel or milled head 9.

As far as the supporting carriage 3 is concerned, this retains substantially the shape of a roller-skate, the gauge and base of the two sets of wheels being suitably chosen in order to ensure a good stability to the apparatus when in service. Furthermore, the two sets of wheels 10 and 11 are identical and can be respectively set around vertical spindles 12 and 13, and can further be more or less locked on these spindles by means of wing nuts 14, 15, screwed onto the ends of said spindles and themselves more or less tightened on corresponding bosses 16 and 17, the latter forming one piece with the carriage frame.

Finally, the rod 4, fitted at the center of the carriage 3 and supporting the cradle, extends underneath the plate forming the frame thereof, by a threaded part 18, on which a variable number of plates 19 can be threaded, these being guided into grooves 20 of the frame and retained in place by a nut 21, screwed onto the end of the threaded rod 18.

The plates allow to adjust at will the total weight of the apparatus.

It goes without saying that the invention is not strictly limited to the embodiments of the same which have been represented and which have just been described. Modifications of details can be brought to them within the scope of the appended claims. For instance, the wheels of the two rolling sets of the carriage

could be replaced by balls of a suitable diameter and suitably placed.

What I claim as new is:

1. An apparatus for limb re-education comprising a carriage constituted by a frame resting on two sets of wheels, a vertical rod fitted substantially at the center of said carriage, a cradle placed at the top of said vertical rod and adapted to receive at least a section of a limb to be re-educated, a flexible band fitted onto this cradle and adapted to maintain into said cradle the limb to be re-educated, and, between said cradle and the top of said vertical rod, connecting means adapted to allow said cradle to be set and immobilized into any position in space above said carriage frame.

2. Apparatus according to claim 1 in which said means for connecting said cradle and said vertical rod are constituted by a ball-and-socket joint, and a screw and nut mechanism for locking said joint.

3. Apparatus according to claim 1 in which said means for connecting said cradle and said vertical rod are constituted by a first ball at the top of said vertical rod, a second ball carried by the underpart of cradle, two jaws respectively disposed on both sides of the said two balls and comprising sockets for reception of the said balls and means comprising a screw and nut mechanism for locking said jaws onto said balls.



4. Apparatus according to claim 1, in which each of the sets of wheels of the carriage comprises a cross-piece, two wheels journalled in the respective ends of said cross-piece, and means for fitting said cross-piece of each of the two sets of wheels respectively on each end of said carriage, this allowing the controlled setting of said cross-piece around an axis perpendicular to the carriage.

5. Apparatus according to claim 1, in which said carriage frame carries a variable number of plates in order to adjust at will the weight of said carriage.

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