March 24, 1953 R. T. HICKERSON 2,632,439

LEG BRACE

Filed Oct. 23, 1950

Fig. 1

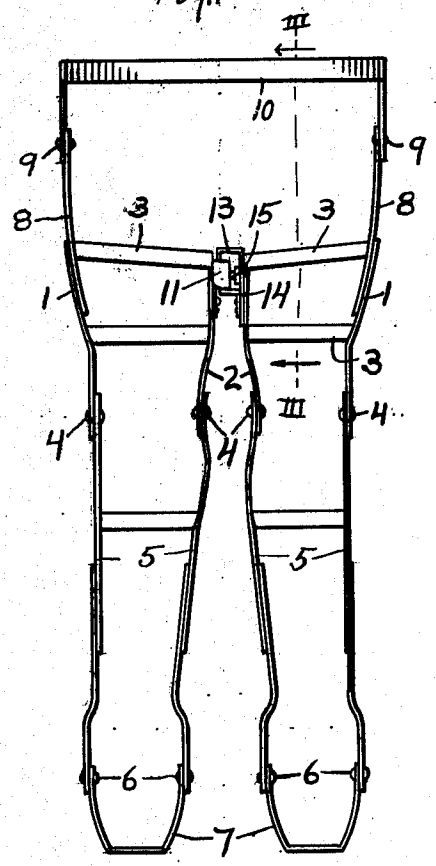


Fig. 3

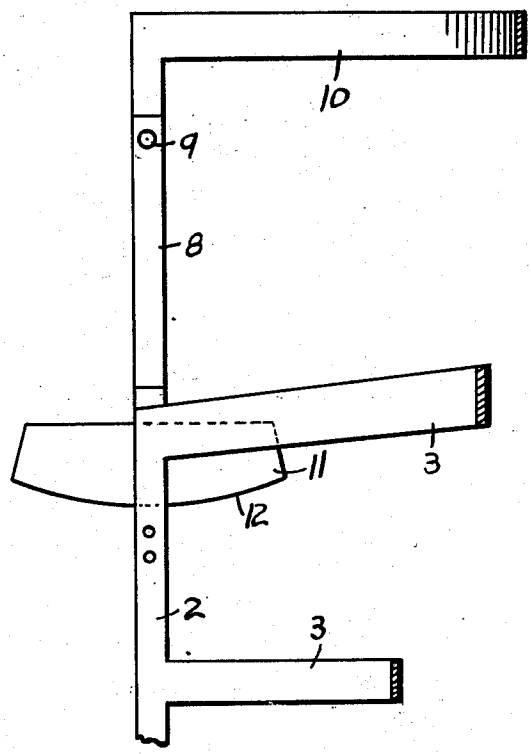


Fig. 2

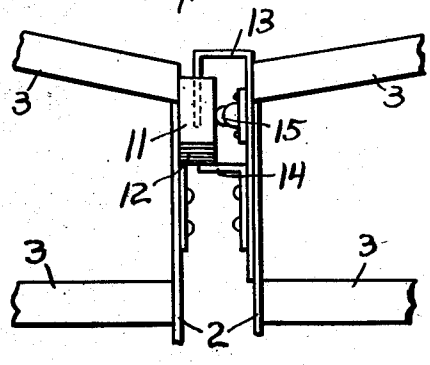
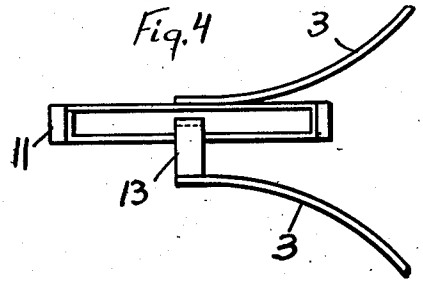


Fig. 4



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LEG BRACE

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4 Claims. (Cl. 128—80)

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This invention relates to leg braces for crippled persons, such as those suffering from infantile paralysis, spastic palsy, accident or the like, and is particularly adapted for those who have lost muscular or nervous coordination in the control of their legs in walking. Many patients of this type can only swing their legs by the expenditure of tremendous physical and nervous effort, and frequently the arc through which the leg will swing cannot be controlled nor predicted by the patient. Under these conditions the teaching of a patient to walk is a most serious undertaking.

The chief object of the present invention is to provide leg braces which are interconnected so that they can only travel or move in parallel planes, the point of connection preferably being just below the crotch. By this means accidental spread or crossing over of the legs is avoided and the danger of falling is lessened. This crossing over of the legs is usually called "scissoring," and is involuntary on the part of the patient.

Another object of the invention is to provide an interconnection between the leg braces which will not impede the swinging of the legs in parallel planes and in which accidental disengagement of the interlock in any direction is avoided.

With the general objects named in view and others as will hereinafter appear, the invention consists in certain new and useful features of construction and organization of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawing, in which:

Figure 1 is a front view of a pair of leg braces having the interconnection of the invention.

Figure 2 is an enlarged fragmental front view of the leg braces.

Figure 3 is a fragmental view taken on the line III—III of Figure 1.

Figure 4 is a fragmental plan view showing the interconnecting members of the leg braces.

In the said drawing, where like reference characters identify corresponding parts in all of the figures, 1 and 2 respectively indicate the uppermost pairs of straps forming the outer and inner leg brace members. These members are ordinarily secured permanently together in pairs for the right and left leg by means of connecting arcuate frame members 3. The ends of the inner strap members 2 terminate just below the crotch of the patient where the device is in operative position.

Pivotally connected to the lower ends as at 4 of the upper leg brace members 1—2 are brace

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extension frame members 5 of any desired construction, and these in turn are customarily connected by pivots 6 to foot straps 7. The detailed construction of these parts is immaterial and consequently they are not further described, other than to state that it is customary to make them extensible and to provide the hinge points with locks so that pivoting can be prevented if desired, depending upon the physical condition of the patient.

Extending upwardly from the outer brace members 1 thigh pieces 8 may be provided. The thigh pieces may be connected by pivots 9 to an arcuate member 10 for encircling the body of the patient if desired. The details of this part of the construction are also immaterial to the invention since their use depends on the physical condition of the individual involved.

Secured to the upper outer face of one of the brace straps 2 is a hollow rectangular keeper or guide 11 having an arcuate lower edge or track 12. The space within the keeper 11 forms a track or guide way for the end of an interlocking member or hook 13 rigidly secured to the upper inner face of the other strap 2 of the pair of leg braces. Assuming the hinge connections 9 are the hip joint of a patient, it will be evident that the brace frame members 1—2 can swing back and forth as in walking, the hook 13 within the keeper 11, limiting this swinging movement to substantially parallel planes and thus preventing either leg crossing or a spraddling or outward movement beyond limits controlled by the slack of the hook within the keeper.

It has been found however that the swinging of the leg of a patient is frequently accompanied by an upward lift of one or the other hip joint, and if this movement is not limited or controlled, the interlocking member 13 may become detached or withdrawn from the guide 11. To prevent this possibility it is preferred to provide a catch or limit stop, illustrated in the form of a right angle bracket 14 which underlies the lower edge 12 of guide 11 and oscillates back and forth in an arc substantially corresponding to the contour of the edge of the guide.

In order to reduce friction and possibly overcome noise or chatter of the parts, it is preferred to provide a ball bearing roller 15 which will normally roll back and forth on the outer face of the guide 11. Of course, if desired, antifriction means of similar or equivalent nature could be provided on the ends of the hook within the keeper or otherwise.

From the above description and drawing, it

will be apparent that I have produced a construction embodying all of the features of advantage set forth as desirable, and while I have described and illustrated the preferred construction, it is to be understood that I reserve the right to all changes within the spirit and scope of the appended claims.

I claim:

1. A leg brace comprising a pair of brace members adapted to swing with the legs, a guide carried by one brace and projecting fore and aft to restrict relative movement of the braces to parallel planes, and a member carried by the other brace interlocked with said guide.

2. A leg brace comprising a pair of brace members adapted to swing with the legs, and a connection below the plane of the crotch of the braces limiting their relative movement to parallel planes, said connection comprising a rigid keeper on one member and a rigid hook on the other member, said keeper and hook being free for relative fore and aft parallel oscillation.

3. A leg brace comprising a pair of brace members adapted to swing with the legs, a rigid keeper secured to the face of one of the inner brace members, and a rigid hook carried by the other brace member and projecting downwardly into said keeper.

4. A leg brace comprising a pair of brace members adapted to swing with the legs, a rigid keeper secured to the face of one of the brace members, a rigid hook carried by the other brace member and engaged with the keeper to prevent scissoring movement of the brace members, said keeper having an arcuate guide edge, and a stop on the hook-equipped member underlying the arcuate guide edge of the keeper to prevent withdrawal of the hook from said keeper.

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