June 18, 1946. J. J. JANOSKO 2,402,330

SAFETY CRUTCHES

Filed April 20, 1944 2 Sheets-Sheet 1

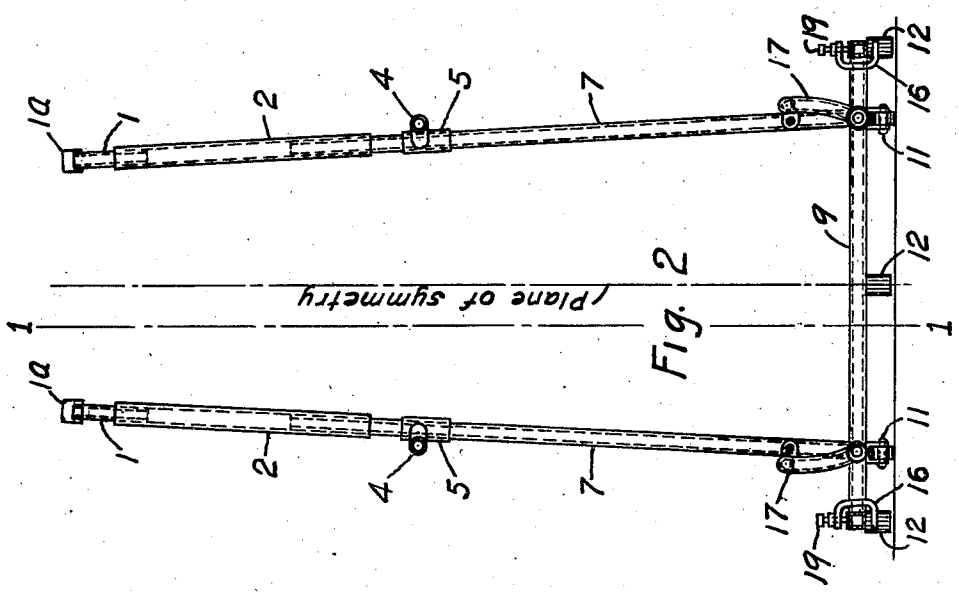


Fig. 2

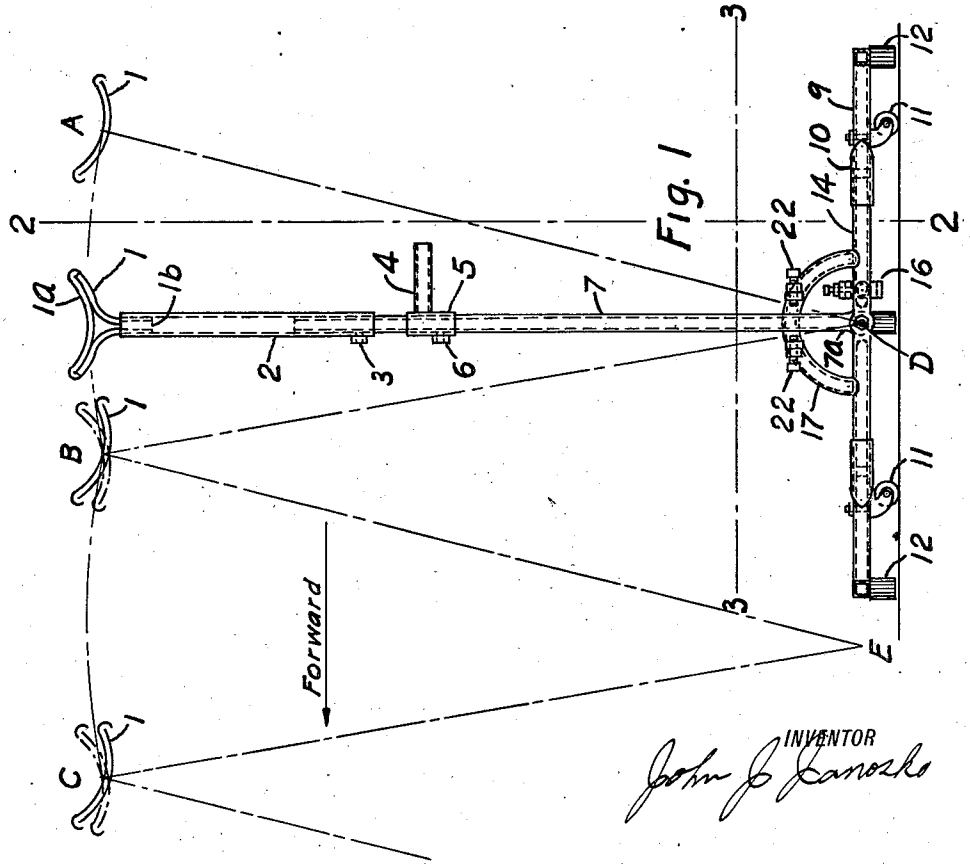


Fig. 1

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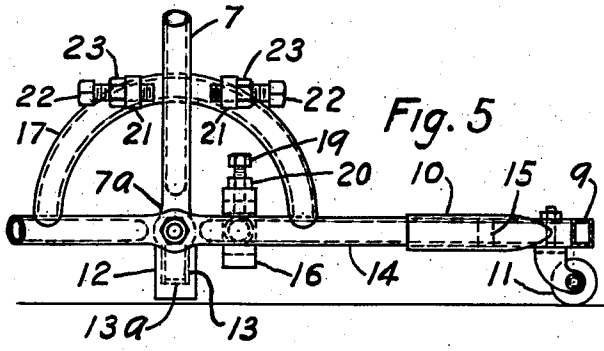


Fig. 5

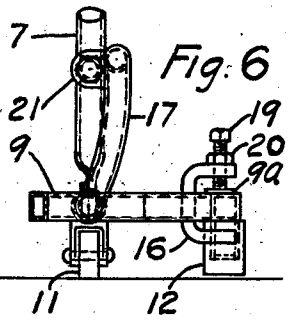


Fig. 6

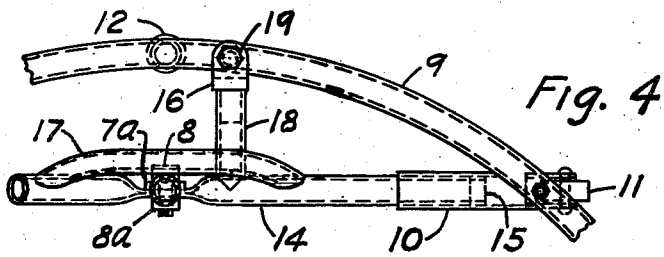


Fig. 4

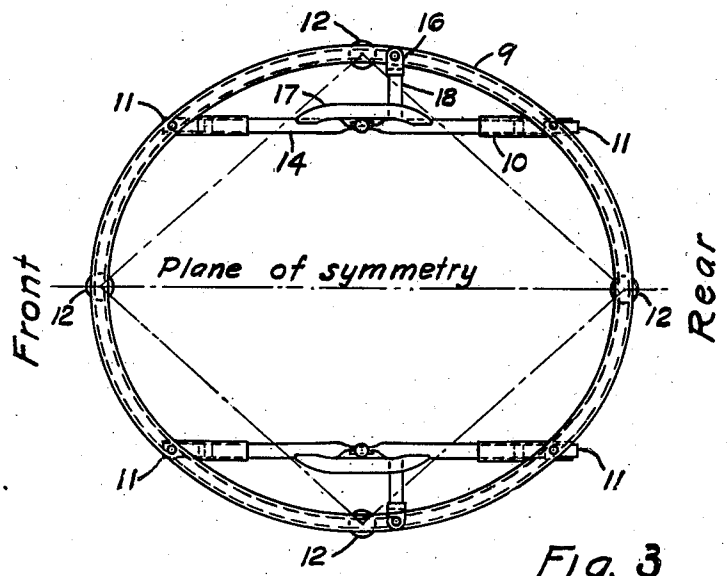


Fig. 3

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UNITED STATES PATENT OFFICE

2,402,330

SAFETY CRUTCH

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Application April 20, 1944, Serial No. 531,942

6 Claims. (Cl. 155—22)

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During recovery from a fracture or other injury of the spine, legs or feet, a convalescent, due to weakness or lack of muscular control, may, when walking, need support and assistance that provides safety, comfort and convenience to a greater degree than is found in such crutches or other walking aids as are now available.

The prime object of this invention is to provide such a support.

A further object is to provide various adjustments in the apparatus to ensure a maximum of safety, comfort and convenience for the user.

The construction, by means of which these objects are attained, is shown in the accompanying drawings in which

Fig. 1 is a sectional elevation on line 1—1 of Fig. 2.

Fig. 2 is a sectional elevation on line 2—2 of Fig. 1.

Fig. 3 is a sectional plan on line 3—3 of Fig. 1.

Fig. 4 is an enlargement of a portion of Fig. 3.

Fig. 5 is a side elevational view of the structure shown in Fig. 4.

Fig. 6 is a rear view of that portion of the device illustrated in Fig. 5.

General description

The apparatus consists essentially of a pair of adjustable crutches articulated to a light, easily movable, stabilizing base structure.

Forward and backward, as well as transverse swinging movements of the crutches, are each limited by adjustable means described later.

The crutch members are free, within adjustably controlled safe limits, to respond to the movements and needs of the user, and they are manipulated in a manner similar to ordinary crutches.

Ordinary crutches depend upon friction between the crutch tips and the floor to prevent them from slipping when the crutches are inclined, but a wet floor may cause them to slip.

In this apparatus the crutches are strongly connected to the base and can not slip. The limited swings of the crutches do not permit a vertical line, through the center of gravity of the user's body, to fall outside of a quadrilateral formed by lines passing through the axes of stabilizing members. It is therefore practically impossible for the user to fall forward, backward or sidewise.

It might appear that the case could scoot from under the user, but, since the angular movements of the crutches relative to the base are always safely limited, incipient scooting movement in

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any direction would cause the base member to tip very slightly, resulting in one or more of the stabilizing cushions being forced against the floor; thus stabilizing the entire apparatus and providing safety for the user.

Detailed description

To provide strength with lightness many members are tubes of steel or light, strong alloys. Fixed joints are preferably welded.

In Fig. 1, arm piece 1 may be made from a tube, the upper end of which is split and formed to receive a pad 1—*a* of soft material such as felt or rubber. The lower end 1—*b* extends down into tube 2 with a close fit but free to turn about its axis in response to movement of the user's arm.

Tubes 2 and 7 telescope, for adjustment of the height of the crutches, and safety set screw 3 locks them together. Tubular member 7 is pivotally connected to 14.

4 is a handle or grip welded to sleeve 5, which can slide on, and turn about 7. Safety set screw 6 holds grip 4 at any desired height or angle.

The lower end of tube 7 is flattened and drilled to form an eye 7—*a* to receive a bolt 8, the shank of which is round and smooth where it passes through the eye 7—*a*, and is threaded where it passes through the flattened portion of the bar 14. This allows the crutch member 7 to swing forwardly or rearwardly relative to the base 9. Locknut 8*a* secures bolt 8 so that the crutch may swing freely on it without the bolt working loose.

The base 9 is oval or elliptical, as shown in Figure 3, with its major axis in the plane of symmetry and is formed of tubing which is rectangular in cross section. Its width allows it to go through an ordinary house door and its length is such as to provide walking room and stability.

Attached to the base or frame 9 are four swiveled casters 11 and four stabilizing cushions 12, located preferably as shown in Fig. 3. Welded to frame 9 are four round tubes 10 extending horizontally inward and parallel to the plane of symmetry. Tubes 14 are free to turn since each tube has its ends fitting into larger tubes 10 forming sockets which are welded to the base frame 9, but axial movement is prevented by short tubes 15 welded inside of the tubes 10. Tubes 10 are slipped over 14 before they are welded to 9. This construction allows the crutches to swing transversely about the common axis of the sockets 10 and the tubular bars 14.

Welded to tubes 14 are laterally extending tubes 18, the outer ends of which carry yokes 16, each of which is fitted with an adjusting screw 19,

and a lock nut 20. Screw 19 is so adjusted that it bears on reinforcing pad 9—*a* over which it is located, when crutch tube 7 is in the vertical position as shown in Fig. 6. The height of the yoke 16 is such that the crutches can swing inward until the arm pieces approach the plane of symmetry, when movement is stopped by contact between the lower arm of the yoke with the under side of 9.

To limit the forward and backward swings of the crutches, arcuate tubes 17 are welded to tubes 14. Threaded lugs 21 are welded to 17 and are fitted with adjusting screws 22 carrying lock nuts 23. As the crutch tube 7 swings about pivot 8 its outside is in contact with the inner side of the companion tube 17, and any outward thrust on crutches 7 is transferred by tubes 17, 14 and 18, and screw 19, to base 9. If this side thrust is great enough, one or more of the cushions 12 will contact the floor and prevent overturning of the apparatus.

Tubes 13, welded to frame 9, carry the cylindrical rubber cushions or pads 12, which are bored to fit tightly over 13, and to bear against the closed end 13—*a* of the tubes 13. The lower ends of these cushions are, normally, slightly above the floor.

How the apparatus is used

Assume that the patient is sitting on the side of a bed and the apparatus standing near the bed with the rear portion of the frame or base 9 extending under the bed. He grasps the crutch handles 4, raises his body and places the arm pieces 1 under his arm pits. (See Fig. 1—position A.) As he leans and steps forwardly, the arm pieces advance to position B. Resting his weight on one or both feet, he now moves the base by pushing forwardly and lifting slightly on the crutch hand grips 4. During this movement of the base, the pivots at the lower ends of the crutches advance from position D to position E, the weight of the apparatus being carried by castors 11. These alternate movements are repeated as the patient walks forward.

I claim:

1. Safety crutches comprising a rigid base structure, swiveled casters attached to and supporting said base, stabilizing cushions secured to and depending from said base and normally disposed slightly above the floor, a pair of crutches provided with means for adjusting the height of said crutches, means pivotally connecting said crutches respectively to opposite sides of said base for forward and backward swinging movement and for transverse movement inwardly or outwardly relative to said base, adjustable stop means on said base respectively engageable with said crutches to limit forward and rearward swinging thereof, and other stop means in rigid relation with each of said crutches and respectively engageable with said base for limiting the transverse swinging movement of said crutches.

2. Safety crutches comprising a base consisting of an oval frame having curved side and end portions, casters carried by said frame and depending therefrom adjacent ends thereof, pads depending from ends and opposite sides of said frame and normally held spaced from a floor by the casters, bars extending longitudinally of said frame in chordal relation to opposite side portions thereof and rotatably connected with the frame, crutches pivoted to said bars for tilting movement longitudinally of the frame and tiltable transversely of the frame by turning movement of the bars, arms carried by and extending upwardly from said bars adjacent to and extending forwardly and rearwardly of said crutches, screws carried by said arms in front of and rearwardly of the crutches and constituting adjustable abutments for limiting tilting of the crutches forwardly and rearwardly of the frame, and arms extending outwardly from said bars and having vertical yokes at their outer ends straddling side portions of the frame for limiting transverse tilting of the crutches and applying downward pressure to side portions of the frame and forcing pads at sides of the frame into contact with a floor.

3. Safety crutches comprising a base consisting of an oval frame having curved side and end portions, sockets carried by said frame adjacent ends of its end portions and extending longitudinally of the frame inwardly of the side portions thereof, bars extending longitudinally in said frame inwardly of its side portions in chordal relation to opposite side portions of the frame and rotatably mounted in said sockets, casters carried by said frame at outer ends of said sockets, pads depending from ends and sides of said frame and located midway the length of its end portions and its side portions and normally spaced upwardly from a surface upon which the casters rest, crutches disposed vertically and pivoted at their lower ends to said bars midway the length thereof for swinging movement longitudinally of the frame and being tiltable transversely of the frame by turning of the bars in the sockets, arcuate arms carried by said bars and extending upwardly therefrom in crossed relation to said crutches, lugs carried by said arms in front of and rearwardly of the crutches, screws threaded through said lugs and constituting adjustable stops for limiting longitudinal swinging of the crutches, side arms extending outwardly from said bars adjacent said crutches, yokes at outer ends of said side arms straddling side portions of said frame and having upper and lower fingers for limiting transverse tilting of the crutches and tilting the frame to move the side pads into contact with the surface upon which the casters rest, and frame-engaging screws carried by the upper fingers of said yokes.

4. Safety crutches comprising an oval base having curved side and end portions, bars extending longitudinally of said base in chordal relation to opposite sides thereof and rotatably connected with the base, casters depending from said base adjacent ends of said bars, pads depending from said base at ends and opposite sides thereof and normally spaced upwardly from a surface upon which the casters rest, crutches pivoted to said bars for swinging movement longitudinally of the base the rotatable bars mounting the crutches for transverse tilting movement, members extending upwardly from said bars and carrying adjustable abutments for engagement by the crutches to limit longitudinal swinging of the crutches and cause tilting of the base to move the rear pads into contact with the surface upon which the casters rest, and members extending outwardly from said bars and carrying yokes straddling side portions of the base for limiting transverse tilting of the crutches and causing transverse tilting of the base to move the side pads into contact with the surface upon which the casters rest.

5. Safety crutches comprising an oval base having curved side and end portions, bars extending longitudinally of said base in chordal rela-

tion to opposite sides thereof and rotatably connected with the base, casters depending from said base adjacent ends of said bars, pads depending from said base at ends and opposite sides thereof and normally spaced upwardly from a surface upon which the casters rest, crutches pivoted to said bars for swinging movement longitudinally of the base the rotatable bars mounting the crutches for transverse tilting movement, means carried by said bars for engagement by said crutches to limit longitudinal swinging of the crutches and cause the end pads to be moved into contact with the surface upon which the casters rest, and means carried by the side bars for engaging side portions of the base for limiting transverse tilting of the crutches and causing transverse tilting of the base to move the side pads into contact with the surface upon which the casters rest.

6. Safety crutches comprising an oval base having curved side and end portions, casters depending from said base adjacent ends of side portions

thereof, pads depending from said base at opposite sides and ends thereof and normally spaced upwardly from a surface upon which the castors rest, the pads at sides of the base being in outwardly spaced relation to the castors, said base being tiltable upon the castors to move the pads into contact with a surface upon which the castors rest, crutches at opposite sides of said base mounted for tilting movement longitudinally of the base and transversely thereof, means for limiting tilting of the crutches longitudinally of the base and thereby cause the crutches to rock the base upon casters at ends of the base as fulcrums and move the end pads into contact with the surface upon which the casters rest, and means for limiting tilting of the crutches transversely of the base and causing transverse rocking of the base upon casters at sides of the base as fulcrums to move the side pads into braking contact with the surface upon which the casters rest.

JOHN J. JANOSKO.