June 11, 1935. G. DORSCH 2,004,487

PELVIC ATTACHMENT FOR ARTIFICIAL LEGS

Filed Aug. 17, 1933

Fig. 1.

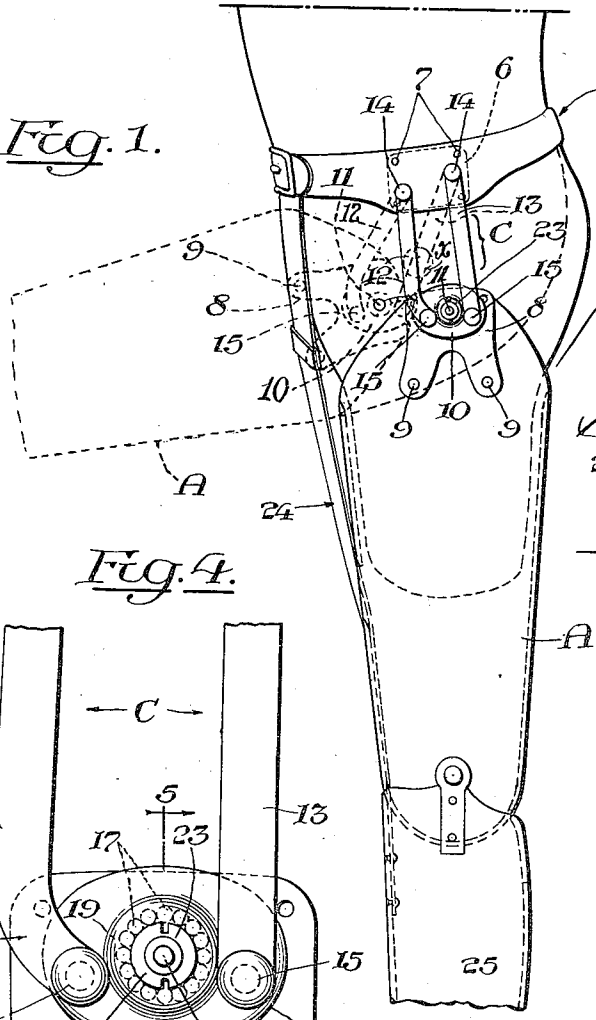


Fig. 2.

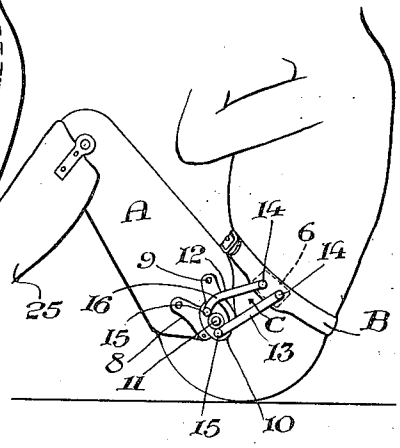


Fig. 4.

Fig. 5.

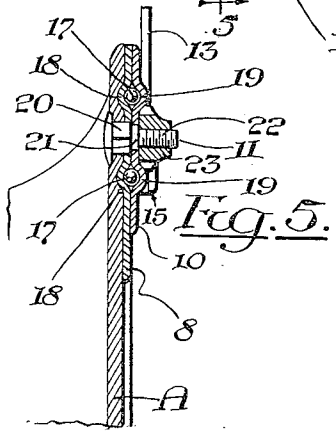
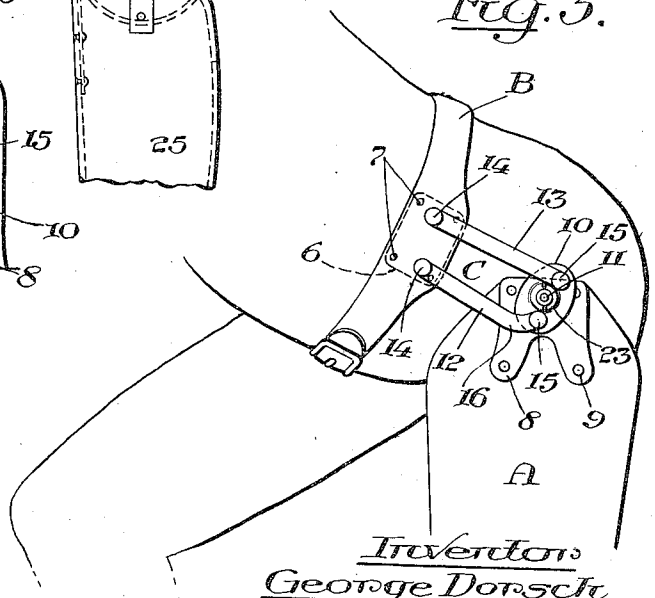


Fig. 3.



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PELVIC ATTACHMENT FOR ARTIFICIAL LEGS

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Application August 17, 1933, Serial No. 685,540

4 Claims. (Cl. 3—11)

This invention relates to artificial legs, and more especially to a pelvic belt attachment therefor.

The object of the invention is to provide a simple, compact and reliable joint connection between the belt and the upper or thigh section of an artificial leg whereby the movements of the limb in and to any of a variety of simulative natural positions can be efficiently accomplished with ease and confidence by the user.

To this end my invention embodies a link and rocker device of novel construction and operation connecting the belt and the upper section of the leg in such manner that the belt is maintained in substantially the same position around the pelvic zone, irrespective of the various movements of the limb or the body of the wearer, which device in an efficient form of the invention will be hereinafter described, and the scope of the invention then expressed in the appended claims.

In the drawing—

Figure 1 is an elevation of the attachment as in use, showing the relative positions of the belt, link and rocker members when the user is in standing posture, and also indicating in dotted lines the positions of such members when the limb is raised as in sitting.

Fig. 2 illustrates the relative positions of the said members when the user is in a sitting posture on the floor with his knee raised.

Fig. 3 illustrates the relative positions of the said members when the body of the user is bent forward as in a kneeling or creeping posture.

Fig. 4 is an elevation of the leg plate, the rocker thereon, and the adjacent pivoted ends of the links.

Fig. 5 is a transverse vertical section, as on the line 5—5 of Fig. 4.

Referring to the drawing, A designates the upper or thigh section of an artificial leg as in use; B designates the pelvic belt, and C designates the joint connection between the belt and the outer side of the adjacent section of the leg in which the usual stump-receiving socket is formed.

In the preferred embodiment of the invention herein illustrated this connection comprises a plate 6 riveted or otherwise firmly secured to one side of the belt, as at 7, so as to constitute, in effect, a part of the belt; a plate 8 riveted or otherwise secured to the outer side of the upper leg section, as at 9; a rocker comprising a lever plate 10 centrally pivoted to the leg plate, as at 11, in close relation to the region of the trochanter of the femur and below the trochanter head (x), when the artificial leg is applied and in use and a pair of links 12 and 13 pivotally connected to the two plates, as at 14 and 15, respectively.

The links 12 and 13 are of such a length that the rocker is below the trochanter joint of the wearer, whereby the rocker is moved in the same direction as the leg during its swinging movement as distinguished from a movement in the reverse direction were the rocker above the trochanter joint.

The front link 12 is offset from its lower pivotal connection, as at 16, and is therefore shorter than the back link 13. The lower axes 15 of the two links when the links are in vertical position or substantially so are equally spaced at the respective sides of and slightly below the axis of the then horizontally-disposed lever plate 10, and the upper pivotal point 14 on the belt plate of the rearward longer link 13 is somewhat above the adjacent pivotal point of the forward link 12.

Preferably an anti-friction bearing of substantial area for the rocker is provided, which bearing in the present instance comprises balls 17 seated in complementary annular grooves or races 18 and 19 formed in the leg and lever plates respectively. The pivot pin 11 preferably comprises a polygonal portion 20 which is seated in corresponding apertures in the wall of the leg section and in the plate 8; a cylindrical portion 21 upon which the lever plate is centrally fulcrumed, and a threaded portion 22 having a securing nut 23 for the lever plate.

24 designates the usual elastic control strap connecting the pelvic belt and the lower pivoted section 25 of the artificial limb.

By the foregoing described construction it will be apparent that the limb is always kept close to the body and can not be pulled therefrom, thus inspiring confidence in the user; and that there is provided between the artificial limb and the pelvic belt an efficient joint connection which is readily responsive to the various movements of the stump of the thigh without objectionable effort or discomfort and which connection permits free bodily movements of the wearer. For example, as illustrated in Fig. 1, correctness of normal standing posture is ensured by virtue of the upright parallel relation of the links at the respective sides of the axis of the horizontally-disposed lever plate, and as indicated in this figure in dotted lines the limb by a natural movement of the associated thigh of the user can be swung forward, as in sitting

with perfect knee control by reason of the simultaneous angular and rotative movements of the pivotal link and rocker connection in co-operative relation to the movements of the limb without in any case any substantial shifting of the belt from its original position relative to the pelvic zone of the wearer's body. That is to say, in the forward movement of the leg the rocker is forwardly swung therewith and at the same time by virtue of the relatively long and short link connections is freely movable about its axis 11 to accommodate the curved movements of the lower pivotally connected ends of the forwardly swinging links without binding stress or strain of the links between the rocker and the belt. In other words, the two links swing as a pendulum from their respective pivots 14, while the rocker is moved about its axis in accordance with the curved paths described by the lower ends of the links. In the backward movement of the leg and also during the various movements of the body in relation to the leg, the axis of the rocker is moved with and in the same direction as the leg and the uniform flexible quality of the joint connection is maintained.

By virtue of the curved lower portion of the forward link 12, provision is had for an extended rotative movement of the rocker in the forward swinging motion of the leg, before the link abuts against the securing nut 23 of the pivot pin.

As seen in Fig. 2 the relative movements of the pivoted component parts of the joint connection without any substantial displacement of the belt permit a natural sitting posture of the user, and as seen in Fig. 3 the relative movements of such parts without any substantial belt displacement permit a natural kneeling or creeping position of the user.

It is to be understood that my invention is not limited to the details of construction herein disclosed as the device may be variously modified within the principle of the invention and the scope of the appended claims.

I claim—

1. The combination with a pelvic belt and an artificial leg, of a rocker mounted on the outer side of the upper leg section, and front and back links pivotally connecting said rocker to the belt and of a length to cause the rocker to move with the leg when worn, said links having their axes on the rocker beyond the respective sides of the rocker axis, and the front link being shorter than the back link, whereby the rocker is oscillated during the movement of the leg.

2. The combination with a pelvic belt and an artificial leg, of a rocker mounted on the outer side of the upper leg section, and front and back links pivotally connecting said rocker to the belt and of a length to cause the rocker to move with the leg when worn, said links having their axes on the rocker beyond the respective sides of the rocker axis, and the front link being shorter than the back link, whereby the rocker is oscillated during the movement of the leg, said link having a forward offset adjacent its pivotal connection to the rocker.

3. The combination with a pelvic belt and an artificial leg having a stump-receiving socket in the thigh section thereof, of a rocker mounted to oscillate on the outer side of the said thigh section, and front and back links pivotally connected to said rocker and to the belt and of a length to cause the rocker to move with the leg when worn, said links having their axes on the rocker beyond the respective sides of the rocker axis, the axis on the belt of the forward link being below that of the rearward link on the belt, whereby during the motions of the leg by the wearer the rocker is swung in the same direction as the leg and at the same time is freely moved on the rocker axis in accordance with the curved paths of movement of the lower ends of the links.

4. The combination with a pelvic belt and an artificial leg, of a rocker mounted for independent oscillation on the outer side of the upper leg section, and front and back links pivotally connecting said rocker to the belt and of a length to cause the rocker to move with the leg when worn, said links having their axes on the rocker beyond the respective sides of and on a line below the rocker axis and one of said links being shorter than the other.

GEORGE DORSCH.