March 15, 1938. G. W. AHLER 2,111,018

WALKING BRACE

Filed Aug. 13, 1935 2 Sheets-Sheet 1

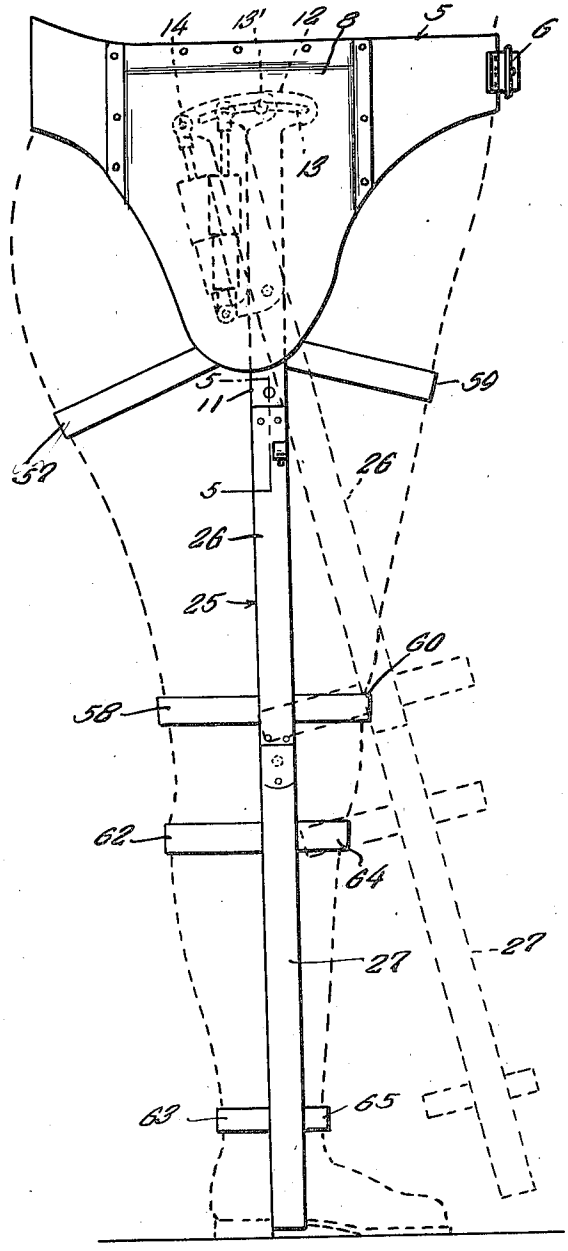
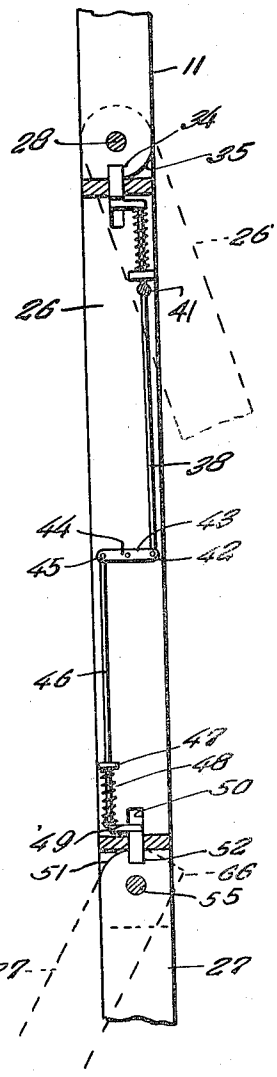


Fig. 1.

Fig. 3.



Inventor

G. W. Ahler

By Clarence A. O'Brien

Attorney

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WALKING BRACE

Filed Aug. 13, 1935 2 Sheets-Sheet 2

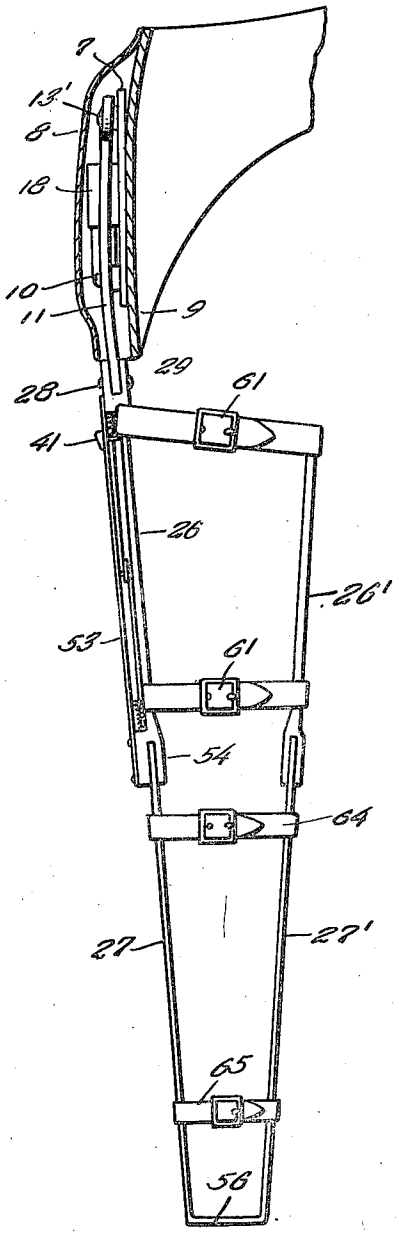

Fig. 2.

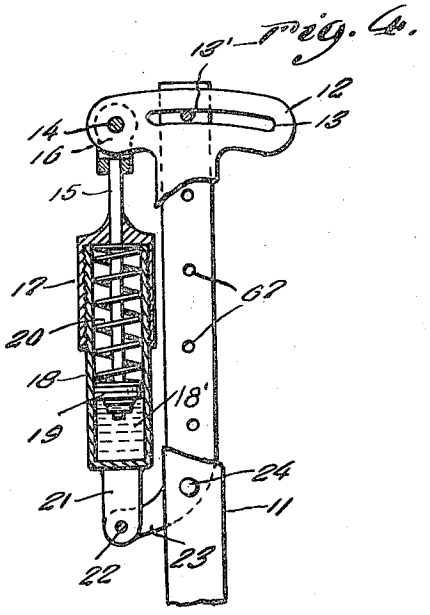

Fig. 4.

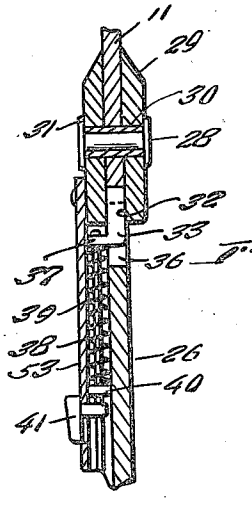

Fig. 5.

Inventor

G. W. Ahler

By Clarence O'Brien

Attorney

Patented Mar. 15, 1938 2,111,018

UNITED STATES PATENT OFFICE

2,111,018

WALKING BRACE

George William Ahler, Colton, Calif.

Application August 13, 1935, Serial No. 35,995

6 Claims. (Cl. 3—1)

My invention relates generally to body braces, and particularly to a body and leg brace adapted to be worn by a person having limited use of his legs, to enable the wearer to walk without the assistance of crutches or canes, thereby retaining the free use of the hands and arms, and an important object of my invention is to provide a mechanically efficient arrangement of this character which is of very great assistance to the wearer and is comfortable to wear.

Another important object of my invention is to provide an arrangement of the character indicated above which can be worn either within or outside of the clothing.

Other important objects of my invention will be apparent from a reading of the following description in connection with the drawings, wherein for purposes of illustration I have shown a preferred embodiment of my invention.

In the drawings:—

Figure 1 is a general side elevational view of the arrangement showing in dotted lines a forward striding position of the device.

Figure 2 is a transverse vertical sectional view taken through the upper part of Figure 1 and showing the leg brace in front elevation.

Figure 3 is a transverse vertical sectional view through an intermediate portion of Figure 2, showing the latching arrangement.

Figure 4 is a transverse vertical sectional view through the upper part of Figure 2 disclosing the operating cylinder mechanism.

Figure 5 is a transverse vertical sectional view taken through Figure 1 approximately on the line 5—5.

Referring in detail to the drawings, the numeral 5 generally designates a belt which may be adjustably strapped front and back by buckle strap means 6 around the waist of the wearer just above the hips. At one side or at both sides of the belt 5 is attached a support plate 7 of suitable metal which is enclosed by a hollow cover 8 also secured to the belt 5. The sides of the belt having a depending portion 9 which is coextensive with the shield 8 and forms a non-chafing rest upon the side of the hip of the wearer.

A pivot 10 extending laterally from the lower end portion of the support plate 7 has pivoted thereon the upper section 11 of the leg brace which has on its upper end a portion 12 which is curvedly slotted as indicated by the numeral 13 to receive a bradded pin 13' fastened to the portion 7. The pin has thereon a roller bushing to reduce friction and a felt washer between the head and the arm. The upper end of the piston rod 15, which includes the adjustable part 16 which directly engages the pin 14, slidably enters the longitudinally adjustable and removable cylinder head 17 which is threaded on the cylinder 18 in which works the guide plunger 19 which acts as an abutment for one end of the rectangular cross section expansion spring 20 whose opposite end works against the inner side of the cylinder top 17 and normally draws the piston rod 15 into the cylinder so as to swing the upper end of the upper section 11 in a left hand direction as shown in Figures 4 and 1 so as to swing the lower extremity thereof in a right hand direction to push or swing the complete leg brace forwardly into the forward striding position shown in dotted lines in Figure 1. The cylinder 18 contains a quantity of fluid lubricant 18'.

The lower end of the cylinder 18 has a lug 21 which is pivoted as indicated at 22 to a rearwardly extending part 23 on the lower end of the plate 7. The brace section 11 is pivoted as indicated at 24 to the plate 7 as shown in Figure 4.

The leg brace which is generally designated 25 is composed of the upper section 11, the intermediate section 26, and the lower section 27, and the leg brace is either in the form of a pair of sectional members one on the inner side of the leg and one at the outer side of the leg, or in the form of a single outside member. For illustrative purposes two members are herein shown as clearly indicated in Figure 2. The intermediate section 26 has its upper end pivoted as indicated at 28 in a bifurcated member 29 on the upper end of the intermediate section 26. The pivot 28 like all of the other pivots in the structure is equipped with a bronze or similar bushing 30 so as to reduce wear and prevent looseness of the joints. Heads 31 on the opposite ends of the pin 28 hold the bifurcations together and an opening 32 in the lower end of the bifurcated member 29 admits the latch 33 to engage a notch 34 in the rounded lower end 35 of the upper section 11 in such a position that with the latch engaged in the notch 34 the upper section and the intermediate sections are locked in longitudinally aligned arrangement.

The latch 33 works in an opening 34 in the upper part of the intermediate section 26 and the latch has an arm 37 which works on a rod 38 on which is circumposed an expanding spring 39 whose upper end works against the lower end of the latch arm whose lower end works against a flange 40 on the rod which has therebelow a finger knob 41 for operating the latch. The rod has an extension which is pivotally connected as

indicated at 42 to one end of the rocker 43 which is pivoted as indicated at 44 on the outer side of the intermediate section 26 and has its opposite end pivotally connected as indicated at 45 to the upper end of another rod 46 which has its lower end equipped with a flange 47 working against the upper end of a spring 48 whose lower end works against another latch 49 which operates in an opening 50 in the lower end of the intermediate section 26 to engage the rounded end 51 of the lower section 27 to lock the same in longitudinal extension of the intermediate section in the manner already indicated, the upper end of the lower section 27 being notched as indicated by the numeral 52. A guard plate 53 is connected to the outer side of the bifurcated member 29 and to the outer side of the bifurcated member 54 which is on the lower end of the intermediate section as clearly shown in Figure 2. The upper end of the lower section is pivoted as indicated at 55 within the lower bifurcation 54.

The lower end of the lower section 27 has a horizontal part 56 which goes under the instep of the foot of the wearer. In the case where an inside brace is also provided the part 56 has at its laterally inward end a brace lower section 27' which is pivotally connected to the lower end of the intermediate brace section 26'.

The brace sections are connected by metal straps 63 and 58 which extend around the back of the upper leg of the wearer and flexible straps 59 and 60 which extend around the front of the leg of the wearer and are provided with suitable buckles 61. The lower section has rear connecting bands 62 and 63, and front flexible straps 64 and 65. The strap 57 is of leather.

With the device of the invention in place on the wearer, with the sections of the leg brace in longitudinal extension of each other, it is necessary, in order to permit the wearer to sit down with the leg bent, to push the finger knob 41 downwardly so as to release the latches 33, 49, thereby permitting the sections to pivot relative to each other. As indicated by the numeral 66 the upper end of the lower sections 27 and 27' have squared portions which prevent these sections from swinging forwardly beyond longitudinal alignment with the intermediate section.

When the wearer stands up and places weight on his foot, these sections will become aligned and the latches will snap into place so as to form a rigid whole of the leg brace both inside and outside members and when the weight is taken off the foot, the spring 20 in the cylinder 18 will expand and pull the member 12 downwardly to the rear and thereby swing the lower end of the brace outwardly in a forward striding motion, thereby materially assisting the wearer to step forward and continue walking supported by the device of the invention.

Due to the adjustability of the compression of the spring in the cylinder 18 by adjusting the cover 17, the assistance which the device of the invention gives to forward striding movement of the leg may be changed according to the condition of the wearer. A plurality of vertically spaced holes 67 in the member 23 enables lengthening or shortening the brace within limits to accommodate different leg lengths in different wearers.

Although I have shown and described herein a preferred embodiment of my invention, it is to be definitely understood that I do not desire to limit the application of the invention thereto, and any change or changes may be made in the materials, and in the structure and arrangement of the parts, within the spirit of the invention and the scope of the subjoined claims.

What is claimed is:—

1. A walking brace for the leg, said walking brace comprising means for connection to the trunk of the body, a support plate on the outer side of one side of said means, a sectional leg brace on said support plate and depending therefrom, pivot means connecting the leg brace to said support plate below the upper end of the leg brace, means for removably connecting the leg brace to the leg of the wearer, and means mounted on said support plate and connected to said leg brace above said pivot means for vertically swinging the leg brace in a forward striding motion when the weight of the wearer on the corresponding leg is relieved.

2. A walking brace for the leg, said brace comprising means for connection to the trunk of the body, a support plate on the outer side of one side of said means, a sectional leg brace on said support plate and depending therefrom, pivot means connecting the leg brace to said support plate below the upper end of the leg brace, means for removably connecting the leg brace to the leg of the wearer, and means mounted on said support plate and connected to said leg brace above said pivot means for vertically swinging the leg brace in a forward striding motion when the weight of the wearer of the corresponding leg is relieved, said means comprising a lubricant containing cylinder having therein a spring-pressed plunger.

3. A walking brace of the character described comprising means for connection to the trunk of the body, a support plate on the outer side of one side of said means, a sectional leg brace pivoted to depend from said plate, pivot means connecting the leg brace to said support plate below the upper end of the leg brace, means for removably connecting the leg brace to the leg of the wearer, a transversely elongated element on the upper end of said leg brace, and means mounted on said plate and pivotally and slidably connected to said transversely elongated element for vertically swinging the leg brace in a forward striding motion when the weight of the wearer of the corresponding leg is relieved.

4. A walking brace of the character described comprising means for connection to the trunk of the body, a support plate on the outer side of one side of said means, a leg brace depending from said plate and composed of sections pivoted together, means for removably connecting the leg brace to the leg of the wearer, pivot means connecting said brace to said plate at a point below the upper end of the leg brace, and means mounted on said plate and connected to the upper end of said leg brace for vertically swinging the leg brace in a forward striding motion when the weight of the wearer of the corresponding leg is relieved, and manually releasable latch means on said sections and arranged to hold said sections in longitudinal alignment with each other, said latch means being releasable to permit said sections to pivot relative to each other.

5. A walking brace for the leg, said walking brace comprising means for attachment to the body of the wearer above the hip joint of the leg, a support plate carried by said means, a leg brace, means pivoting said leg brace on said plate to depend therefrom, said leg brace including means for attaching the same to the leg of the wearer, the upper end of said leg brace being formed with

an element rising above the pivotal point of the leg brace and provided in its upper part with a transverse arcuate slot, and a stop pin on said support plate engaging said arcuate slot for limiting the swing of the leg brace in forward and backward directions.

6. A walking brace for the leg, said walking brace comprising means for attachment to the body of the wearer above the hip joint of the leg, a support plate carried by said means, a leg brace, means pivoting said leg brace on said plate to depend therefrom, said leg brace including means for attaching the same to the leg of the wearer, the upper end of said leg brace being formed with an element rising above the pivotal point of the leg brace and provided in its upper part with a transverse arcuate slot, a stop pin on said support plate engaging said arcuate slot for limiting the swing of the leg brace in forward and backward directions, and dashpot means operatively connected between said support plate and to said element at one end of said slot for swinging said leg brace in a forward direction.

GEORGE WILLIAM AHLER.