A. J. GROMES.

LIMB AND FOOT BRACE.

APPLICATION FILED FEB. 26, 1917.

1,336,695. **Patented Apr. 13, 1920.**

2 SHEETS—SHEET 1.

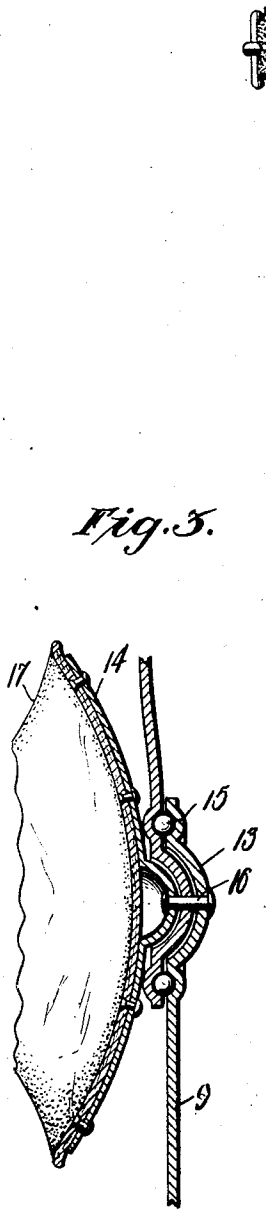


Fig. 3.

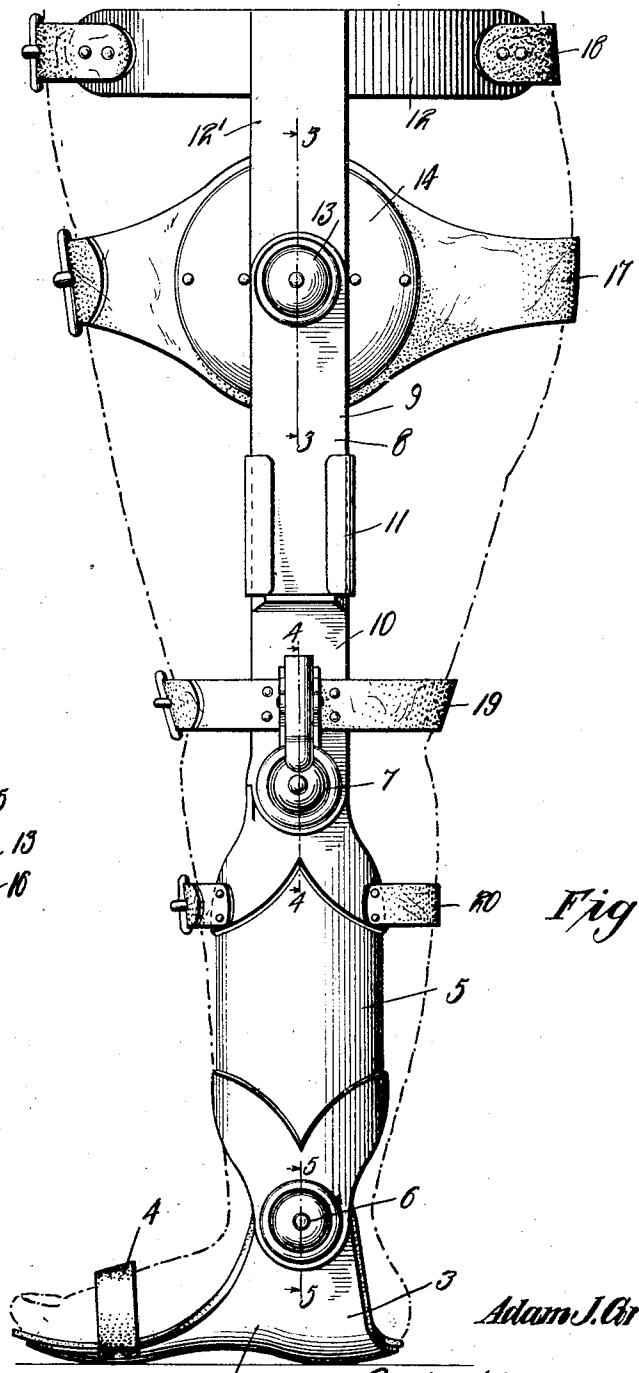


Fig. 1.

WITNESSES

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2 SHEETS—SHEET 2.

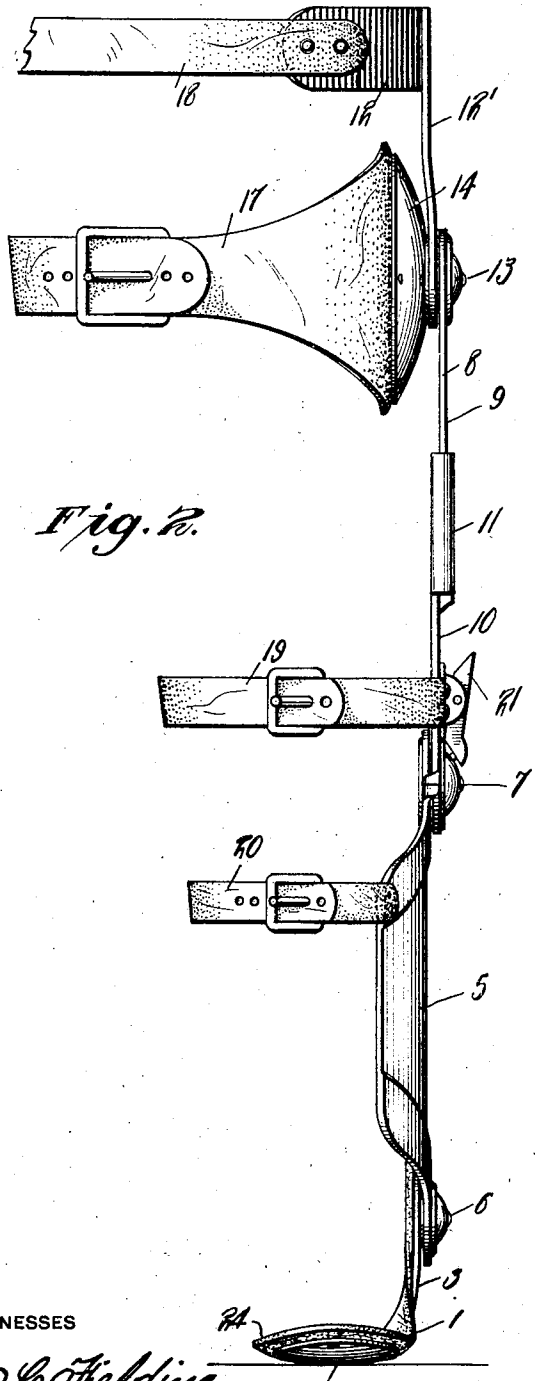


Fig. 2.

Fig. 4.

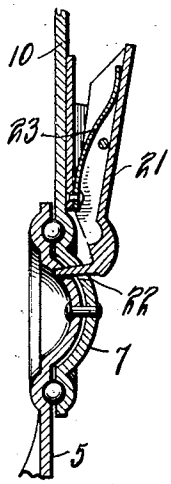
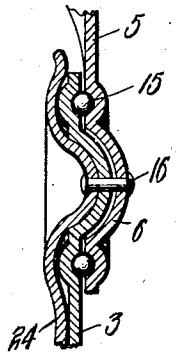


Fig. 5.



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UNITED STATES PATENT OFFICE.

ADAM J. GROMES, OF SINKING SPRING, PENNSYLVANIA.

LIMB AND FOOT BRACE.

1,336,695. Specification of Letters Patent. Patented Apr. 13, 1920.

Application filed February 26, 1917. Serial No. 151,087.

To all whom it may concern:

Be it known that I, ADAM J. GROMES, a citizen of the United States, residing at Sinking Spring, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Limb and Foot Braces, of which the following is a specification.

This invention relates to a brace to be used by persons afflicted with deformed limbs and feet, and the primary object of the invention is to provide a brace that will afford adequate support to the weakened limb and at the same time allow free movement thereof.

Another object of my invention is to provide a device of the character described, which is simple and durable in construction, reliable and efficient in operation, and one which can be manufactured and placed upon the market at a minimum cost.

A further object of the invention is to provide a brace that will conform to the contour of that part of the limb on which the brace is applied.

Another object of the invention is to provide the brace with ball bearings so as to allow the limb to be moved without effort.

Another object is to provide means for locking the parts forming the joint together, when it is necessary to prevent movement of the same.

To accomplish the above and various other objects my invention consists essentially in the combination of a brace having each portion formed to fit that part of the limb to which it is to be applied, with ball bearing joints located opposite the movable joints of the limb, with means for locking the parts forming the joints together, when necessary to prevent movement of the same, and with means for allowing a certain amount of vertical movement of one part on the other when necessary.

The invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, and specifically pointed out in the attached claims.

In describing my invention in detail, reference will be had to the accompanying drawings, wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a side view of the invention.

Fig. 2 is a front view thereof,

Fig. 3 is a sectional view on the line 3—3 of Fig. 1,

Fig. 4 is a sectional view on the line 4—4 of Fig. 1 and

Fig. 5 is a sectional view through the line 5—5 of Fig. 1.

In these drawings 1 is the foot piece consisting of a horizontal portion 2 and a vertical portion 3, said horizontal portion 2 being adapted to receive the foot of the patient and to be secured thereto by a strap 4, when necessary. The part 5 extends between the ankle and knee and is secured to the vertical portion 3 of the part 1 by a joint 6. At the knee said part 5 is connected by a joint 7 with the thigh portion 8 of the brace, said thigh portion having a sliding connection between its members 9 and 10, as illustrated at 11. A curved portion 12 engaging with the waist of the patient is connected with the thigh portion by part 12′ and a joint 13.

A saucer shaped part 14 adapted to engage the hip is secured to the joint 13. The joints 6, 7 and 13 are preferably formed with roller bearings 15, as shown in Figs. 3. 4 and 5. As shown in these figures, each part has a saucer shaped depression therein, engaging a like depression in the adjoining part, with a rivet 16 passing through such depressions and securing them together.

The races for the bearings 15 surround such depressions, as shown in the drawings. The hip part 14 is padded and has a strap 17 for securing such portion to the hip. A strap 18 for the waist portion, and straps 19 and 20 for the knee portions may also be provided. When the afflicted person has difficulty in flexing his knee and it is necessary to make this part of the brace immovable, I provide a catch 21, Fig. 4, having a projection 22 engaging holes in the knee joint, said catch being provided with a spring 23 for holding the catch in engagement.

It is understood that wherever necessary padding may be provided, as shown at 24, on the foot portion of the brace.

The slide 11 allows a certain amount of stooping motion of the hips without affecting the different parts or causing any friction of the brace on the body.

It will be clearly understood that when some parts of the brace are not necessary such parts can be omitted. For instance,

if a person simply wishes to use the foot portion 1 with the portion 5, that part of the brace above the knee may be left off.

I desire it also to be known that the catch 21 may be placed on any of the other joints, if desired or necessary.

It is thought from the foregoing that the advantages and novel features of my invention will be readily comprehended.

I desire it to be understood that I may make slight changes in the construction and in the arrangement and combination of the several parts, provided such changes fall within the scope of the appended claims.

I claim as my invention:

1. In a leg brace, the combination with a hip plate strapped to the wearer's hip, a thigh portion pivoted thereto, of a waist portion pivoted to said hip plate, and said waist portion being provided at its upper end with a semi-circular rigid band strapped to the wearer, said semi-circular band being secured intermediate its ends to said waist portion.

2. In a leg brace, a thigh portion having an outwardly formed cup shaped depression, said thigh portion being provided with an outwardly formed annular recess surrounding said cup-shaped depression, a leg portion having an outwardly formed cup-shaped depression to fit in the depression of the thigh portion, said leg portion being further provided with an inwardly formed annular recess surrounding the cup-shaped depression to coact with the annular recess of the thigh portion and form a ball race, ball bearings in said race to slightly space said thigh and leg portions apart, and a pivot pin passing through the cup-shaped depression of each portion for pivotally connecting them together.

3. A leg brace including a leg portion, a thigh portion consisting of a pair of plates movably associated with one another, the end one of said plates having its longitudinal marginal edges bent to form a pocket for frictionally engaging the end of the coacting plate whereby the plates may slide upon one another and the end of the other plate being enlarged to limit the movement of the section.

4. A leg brace comprising a hip plate strapped to the wearer, a waist portion movably secured to said hip plate and a thigh portion movably secured to said hip plate for the purpose set forth.

5. A leg brace comprising a thigh portion, a waist portion pivotally secured to the thigh portion, and a hip plate pivotally secured to the two last named plates, all of said plates being capable of independent movement.

6. In a leg brace, the combination with a hip plate, a thigh portion, a waist portion, and a common pivot for pivotally connecting the thigh portion and waist portion to the hip plate.

7. In a leg brace, the combination with a thigh portion having an outwardly formed cup shaped depression, a waist portion having a similar depression to be received in the depression of the thigh portion, a cup shaped hip plate having a similar depression to be received in the depression of the waist portion, means for fastening the hip plate to the wearer, and a pivot pin passing through all of said depressions for pivoting said waist and thigh portions to the hip plate.

8. A leg brace comprising a waist portion strapped to the wearer, a hip plate pivotally connected to the waist portion, and a thigh portion pivotally connected to the waist portion, all of said plates being capable of independent movement.

In testimony whereof I affix my signature in presence of two witnesses.

ADAM J. GROMES.

Witnesses:

ADAM L. OTTERBEIN,

EPHRAIM WITMAN.