

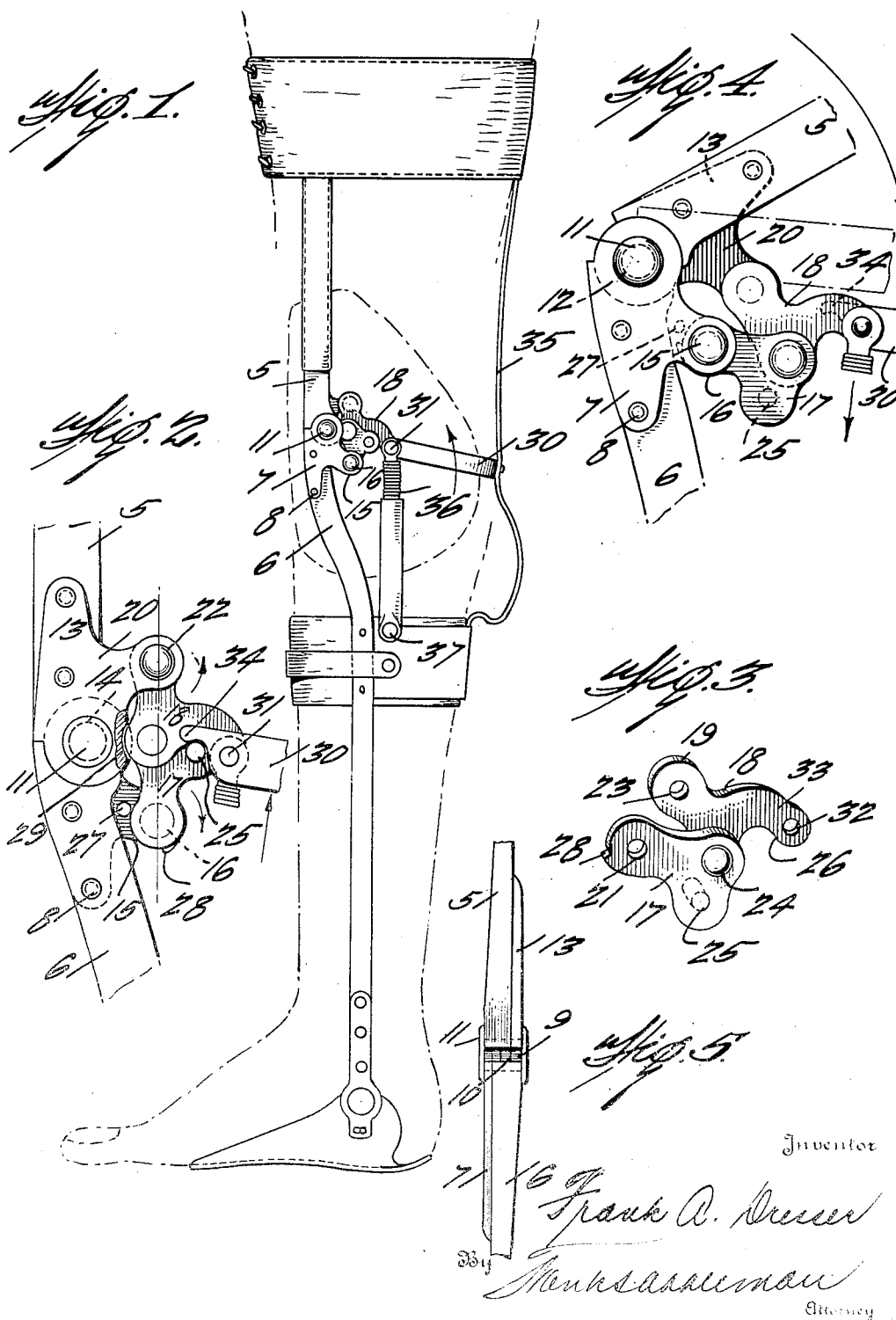
March 1, 1932.

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1,847,823

LEG BRACE

Filed Aug. 23, 1929



UNITED STATES PATENT OFFICE

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LEG BRACE

Application filed August 23, 1929. Serial No. 387,952.

This invention relates to braces of the articulated type, and it has especial reference to a leg brace, including means for holding the brace rigid at the joint and preventing articulation, except when the user is desirous of moving the sections of the brace on the pivot, as in the act of sitting or rising.

It is an object of this invention to produce mechanism which may be termed a "lock" for holding the sections of a brace against movement, the same being associated with novel means whereby the lock may be operated or manipulated to allow free movement of the sections of the brace or returned to operative position where the lock will be effective to hold the brace. Through the employment of the invention, a brace can be constructed by the use of duralumin or other metal lighter than steel and rendered stronger and more rigid so that it is less liable to impairment.

It is a further object to produce a brace which can be conveniently manipulated and which will prove efficient in operation. It has also been found in practice that through the employment of the invention, the knee joint of a brace of this character may be provided with a shield which will prevent wear on the clothes of a user, and that both the inner and outer members of the brace may be strengthened to increase its rigidity.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application, wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a view in elevation of a brace embodying the invention, it being understood that the bracing element of like construction to that shown in this figure is associated with it on the other side;

Figure 2 illustrates an inner side view of one of the joints and braces with parts associated with it;

Figure 3 illustrates a perspective view of elements of the joint lock;

Figure 4 illustrates a view in elevation of the joint and lock in a different position from that shown in Figure 1; and

Figure 5 illustrates an edge view of the brace members and plates and the joint between them.

In these drawings, 5 and 6 denote the upper and lower stays or bracing elements of a brace. The manner of using these in association with means for attaching the brace to the user is conventionally shown, but need not, it is thought, be described in detail, since these may be changed to suit particular requirements and the invention has especial reference to that part of the illustration associated with the joint between the said stays 5 and 6.

In the present embodiment of the invention, the outer surface of the stay 6 is provided with a plate 7 of somewhat irregular configuration, but its shape as to that part which is applied to the stay may be changed to suit particular requirements. It may be secured to the stay by fastenings 8, such as rivets or the like, and, under certain conditions, the joint between the plate and the stay may be maintained by welding processes, but these are matters which may be changed to suit conditions of manufacture. The stays have overlapping extensions 9 and 10, respectively, which are apertured to receive a pivot 11, and the plate 7 has an aperture 12 in line with those of the said extensions, through which the pivot extends.

The stay 5 has a plate 13 secured to it on its inner surface in substantially the manner described with respect to the securing of the plate 7 to the stay 6 and it has an aperture 14 into which the pivot 11 extends. By reason of the construction just described, the plates 7 and 13 tend to reinforce the stays 5 and 6 and strengthen the joint between them.

The plate 7 has an extension 15 which terminates at one side and below the pivot 11 and it has a pivot 16 at its outer end by which a toggle link or lever 17 is oscillatably connected to the extension of the plate 7. A

toggle link or lever 18 of irregular shape in plan has one extension 19 pivotally connected to an extension 20 of the plate 13 and the said extension 20 diverges with respect to the extension 15 of the plate 7. The pivot 16 enters the aperture 21 of the toggle 17 and a pivot 22 in the extension 20 of the plate 13 enters the aperture 23 of the toggle or link 18. The toggles 17 and 18 are oscillatable on a pivot 24 and the toggle 17 is provided with a pin 25 which, when the parts are in certain position, abuts the edge of the toggle 18 at or about the location indicated by the numeral 26, thus limiting the movement of the toggles with relation to each other in one direction. The pin 25 is also engaged by mechanism, as will be presently explained, for breaking the joint of the lock by which the stays are held against movement. The inner surface of the extension 15 of the plate 7 has a pin or lug 27 which is engaged by a shoulder 28 on the edge of the toggle 17 which serves to limit the movement of the stays 5 and 6 as they are swung on their pivot in the direction shown by the arrow, Figure 4. In other words, upon slight additional movement of the member in the direction of the arrow in Fig. 4, the shoulder 28 will abut the pin and arrest the movement in that direction.

When the parts of the invention are in the positions in which they are illustrated in Figure 1, the relations of the parts are such that the pivot 24 has passed the axes of the pivots 16 and 22, the edge 29 of the toggle 18 has engaged an edge of the stay 5, and the pin 25 has engaged the surface 26 of the toggle 18 so that the parts are prevented from further movement and the joint between the stays is locked.

In order to provide convenient means for breaking the joint of the lock, a lever 30 which embraces the rear of the leg of the user is oscillatably mounted near its ends on pivots, such as 31, that are applied to apertures, such as 32, in extensions, such as 33, of the respective toggles 18, one of which, of course, is on each side of the leg, and the lever has a camming projection 34 at each end engaging one of the pins 25. The user of the brace may cause the movement of the brace by bracing it against a chair seat or other object when in the act of sitting or bending the knee in a manner to raise the rear part of the lever and force the inner ends of the lever downwardly, a condition which will result in moving the toggles on their pivots 16, 22 and 24 so that the pivot 24 passes the axes of the pivots 16 and 22 and permits the stays 5 and 6 to be moved, as shown in Figure 4, whereas when the stays are returned to their normal operative position, the parts of the lock will automatically return to position to act as a lock to prevent breaking of the joint between the stays.

A further means for manipulating the lever is shown in the drawings and it consists of an element 35, such as a strap, which may be connected to the lever at the rear of the leg and by pulling on the upper part of the strap the lever will be manipulated to break the joint of the lock.

The elements of the lock are held in operative position to act as a lock by a spring or springs 36 which may be connected to the pivot 31 or to another part of the lock structure, the said spring being anchored to a leg belt 37, as fully shown in Figure 1.

It is observed from an inspection of the drawings that the members 17 and 18 operate in planes parallel with each other and they are substantially contiguous so that they occupy comparatively small space when they are in operative position.

I claim:

1. In a lock for braces, brace members pivotally connected together, a plate secured to a member above the pivot, a plate secured to the other member below the pivot, a member pivoted on the first named plate, a member pivoted on the second named plate, means for pivotally connecting the last mentioned members together between the locations of their pivots with the plates, the axis of the pivot connecting said last mentioned members being movable past the axes of the pivots by which said members are connected to the plates, a lever pivotally mounted on one of the last mentioned members and operative in conjunction with the other of said last mentioned members for oscillating the said members on their pivots, means for limiting the movement of the pivot between the last mentioned members in one direction, and means for limiting the movement of the last mentioned members in the opposite direction.
2. In a lock for braces, brace members pivotally connected together, a plate secured to a member above the pivot, a plate secured to the other member below the pivot, a member pivoted on the first named plate, a member pivoted on the second named plate, means for pivotally connecting the last mentioned members together between the locations of their pivots with the plates, the axis of the pivot connecting said last mentioned members being movable past the axes of the pivots by which said members are connected to the plates, a lever pivotally mounted on one of the last mentioned members and operative in conjunction with the other of said last mentioned members for oscillating the said members on their pivots, means for holding the said lever in one adjusted position, means for limiting the movement of the pivot between the last mentioned members in one direction, and means for limiting the movement of the last mentioned members in the opposite direction.
3. In a lock for braces, brace members piv-

otally connected together, a plate secured to a member above the pivot, a plate secured to the other member below the pivot, a member pivoted on the first named plate, a member pivoted on the second named plate, means for pivotally connecting the last mentioned members together between the locations of their pivots with the plates, the axis of the pivot connecting said last mentioned members being movable past the axes of the pivots by which said members are connected to the plates, a lever pivotally connected to one of the last mentioned members, an abutment on the other of said last mentioned members adapted to be engaged by the lever whereby movement of the lever causes the said last mentioned members to oscillate on their pivots, means for limiting the movement of the pivot between the last mentioned members in one direction, and means for limiting the movement of the last mentioned members in the opposite direction.

4. In a lock for braces, brace members pivotally connected together, a plate secured to the side of the member above the pivot, said plate having an extension, a plate secured to the side of the other member below the pivot and extending parallel with the first mentioned plate, said plate having an extension, a member pivoted to the first mentioned extension, a member pivoted to the second mentioned extension, a freely movable pivot connecting the last mentioned members between the pivots of the said extensions, the axis of the pivot between the said members being movable past the axes of the pivots of the extensions, means for limiting the movement of the pivot between the last mentioned members in one direction, and manually operated means for moving the last mentioned members on their pivots.

5. In a lock for braces, brace members pivotally connected together, a plate secured to the member above the pivot and at the side thereof at the end of the pivot, said plate having an extension, a plate parallel with the first mentioned plate secured to the other member below the pivot and at the side thereof at the end of the pivot, said plate having an extension, a member pivoted to the first mentioned extension, a member pivoted to the second mentioned extension, a freely movable pivot connecting the last mentioned members between the pivots of the said extensions, the axis of the pivot between the said members being movable past the axes of the pivots of the extensions, means for limiting the movement of the pivot between the last mentioned members in one direction, manually operated means for moving the last mentioned members on their pivots, and a spring for causing the joint to automatically lock.

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