

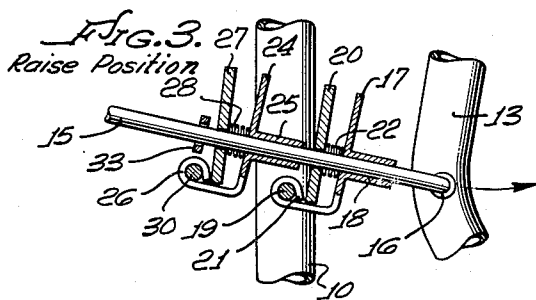
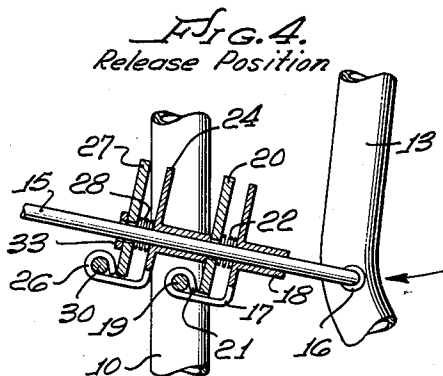
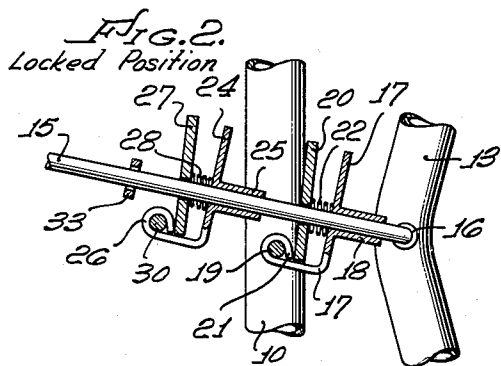
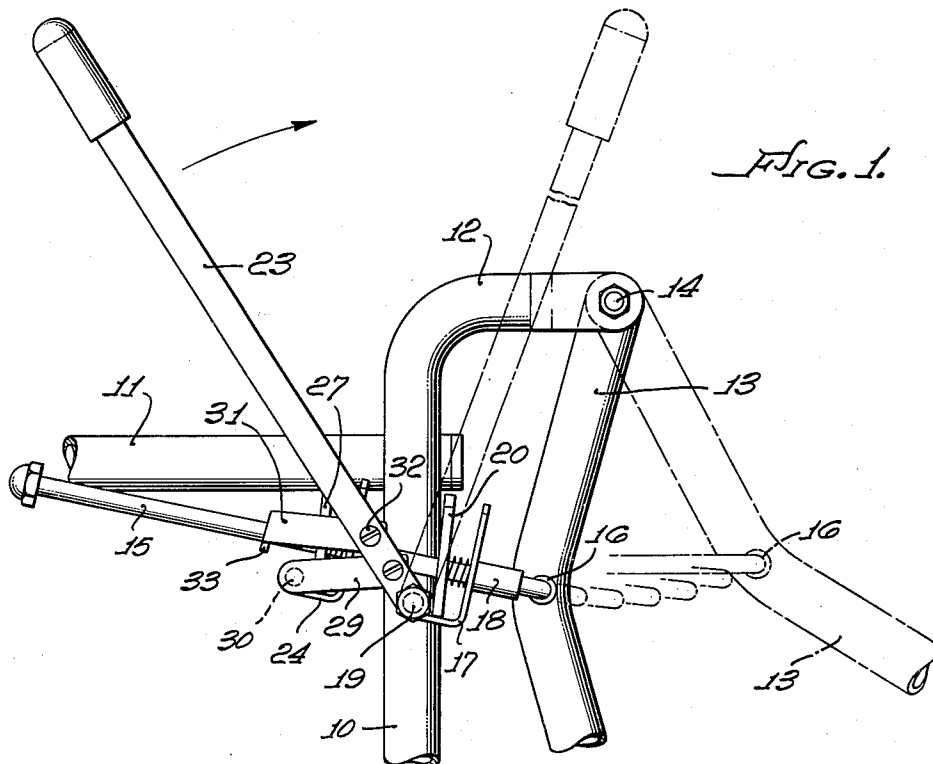
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MANUALLY ADJUSTABLE FOOT AND LEG REST FOR WHEEL CHAIRS

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## 2,991,831 MANUALLY ADJUSTABLE FOOT AND LEG REST FOR WHEEL CHAIRS

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This invention relates to a manually adjustable foot and leg rest for invalid wheel chairs.

Explanatory of the present invention, wheel chairs have heretofore been provided with foot and leg rests that are swingably mounted near the front edge of the seat so that the leg rests can be swung upwardly and forwardly to support each or either foot and leg in an elevated position. To maintain the foot and leg rest in an elevated position a brace has heretofore been pivotally mounted on the foot and leg rest which extends through a clamp or gripping device that has been pivotally mounted on the adjacent leg of the chair.

When the foot and leg rest has been moved or swung into its elevated position the clamp or gripping device grips upon the brace and maintains the foot and leg rest in adjusted position. By causing the clamp to release the brace the foot and leg rest can descend by gravity.

An objection to the constructions heretofore designed as above described is that it is very difficult and sometimes impossible for the occupant of the chair to lean forwardly while seated therein and swing the foot and leg rest upwardly. This is particularly true where the occupant is required not only to lift the weight of the foot and leg rest, but also the weight of his foot and leg resting thereon. In some situations the invalid occupying the chair is so incapacitated that he cannot lean forwardly to reach the foot and leg rest which he desires to elevate.

A primary object of the present invention is to provide an invalid wheel chair with an improved foot and leg rest which can be moved or swung upwardly and forwardly from a suspended position into an elevated position by a reciprocable handle which can be moved back and forth by the occupant of the chair while remaining seated therein against the back rest of the chair.

Another object of the invention is to provide a construction whereby by manipulation of the same handle a release can be effected to allow the foot and leg rest to descend by gravity from its elevated position to its suspended position.

With the foregoing and other objects in view, which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

FIGURE 1 is a partial view of the forward portion of an invalid wheel chair illustrating the upper portion of a foot and leg rest as hingedly mounted thereon and illustrating the elevating mechanism embodying the present invention;

FIG. 2 is a sectional view illustrating details of the elevating mechanism, the clamps thereof being shown in locked position;

FIG. 3 is a view similar to FIG. 2, but illustrating the clamps in positions assumed thereby in the course of raising the foot and leg rest; and

FIG. 4 is a view similar to FIG. 2, but illustrating the positions of the parts in the course of effecting a release so that the foot and leg rest may descend by gravity from its elevated position into its suspended position.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the usual invalid wheel chair is equipped with forward legs, one of which is illustrated at 10. Seat rails,

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one of which is illustrated at 11, are usually connected to each other by an X-brace, not shown, and usually have a flexible seat connecting them. The tops of the legs 10 are usually bent forwardly as at 12 and each leg has a foot and leg rest pivotally mounted thereon at its upper end. One of such foot and leg rest is partially illustrated at 13 and is pivotally connected to the forwardly bent portion 12 of leg 10 at 14 so that it may assume either a suspended position as illustrated in full lines on FIG. 1 or an elevated position as illustrated in dotted lines thereon. With this arrangement the axis of swing of the foot and leg rest 13 on the pivot 14 is approximately coincident with the axis of swing of the invalid's knees while seated in the wheel chair.

Heretofore, each foot and leg rest has been equipped with a brace 15 that is pivotally connected to the foot and leg rest at 16. The brace 15 extends through a one-way gripping device sometimes referred to as a butterfly clamp. This consists of an angular body 17 having an extended hub portion 18 through which the brace 15 slidingly extends. The lower portion of the body 17 is pivotally mounted on a stud or bolt 19 that is rigidly mounted on the leg 10. It has associated therewith a gripping plate 20 through which the brace 15 also extends. The lower portion of the gripping plate 20 bears against the knuckle 21 on the body 17 and a coil compression spring 22 is interposed between the gripping plate 20 and the body 17. By virtue of the fact that the lower portion of the gripping plate 20 has its rearward movement arrested by the knuckle 21, the effect of the compression spring 22 is to cause the gripping plate to assume a slightly inclined position or a non-parallel position with respect to the body 17. In this way if the foot and leg rest 13 is swung upwardly and forwardly the brace 15 merely slides through the gripping plate 20, the body 17 and the hub 18. However, if the foot and leg rest tends to return to its suspended position the compression spring 22 is effective to cause the gripping plate 20 to bind on the brace 15 and thus frictionally hold the brace in its adjusted position.

The above-described construction has heretofore been used on invalid wheel chairs and when it was desired to release the foot and leg rest 13 and allow it to return by gravity to its suspended position the top of the gripping plate 20 was merely pressed toward the body 17 overcoming the action of the compression spring 22. This usually could be accomplished by the invalid while seated in the wheel chair. However, many invalids were incapable of manually swinging the foot and leg rest 13 frequently weighted with the foot and leg of the invalid, into the upward and forward position.

In accordance with the present invention a handle 23 is provided which is mounted for oscillation or back and forth movement with relation to the front leg 10. In the preferred form of construction this handle is pivotally mounted on the same stud or bolt 19 that pivotally mounts the body 17 of the butterfly clamp on the front leg 10. A second butterfly clamp is provided for the brace 15 having a body 24 with an extended hub 25 that encircles the brace 15. This butterfly clamp also has a knuckle 26 against which the bottom of the gripping plate 27 bears and a coil compression spring 28 urges the gripping plate 27 into binding relation with the brace 15.

On the lower end of the handle 23 there is mounted an arm 29 carrying a pivot pin 30 that extends through the knuckle 26. A second arm 31 is pivotally mounted on the handle 23 at 32, this arm having a laterally extending end 33 through which the brace 15 slidably extends. The arm 31 is located more remote from the center of oscillation 19 of the handle 23 than the arm 29.

The operation of the above-described construction is as follows:

Each of the butterfly clamps is in effect a one-way gripping device which grips on the brace 15 when the brace tends to go therethrough in one direction but which freely permits the brace 15 to slide through the gripping device in the opposite direction.

When the handle 33 is swung forwardly from the full-line position shown in FIG. 1 toward the dotted line position therein the arm 29 carries the body 24 forwardly with it. The gripping plate 27 grips on the brace 15 and causes the brace to slide through the gripping plate 20 and the body 17, thus pushing the foot and leg rest 13 upwardly and forwardly a short distance. On reversely swinging the handle 23 the gripping plate 27 and body 24 of the second butterfly clamp merely slide rearwardly on the brace 15 and the brace is held in its forward position by the gripping plate 20. When the handle 23 is again swung forwardly the gripping plate 27 again grips on the brace 15 and pushes it through the gripping plate 20 and body 17 to elevate the foot and leg rest a further distance. This operation is repeated until the foot and leg rest 13 has been swung upwardly and forwardly to the desired elevation.

When it is desired to lower the foot and leg rest 13 this can be accomplished in either of two manners. If the gripping plate 27 is pushed toward the body 24 and the gripping plate 20 is simultaneously pushed toward the body 17, both butterfly clamps will release the brace 15 and allow the foot and leg rest to descend by gravity into its suspended position. This simultaneous opening of the two butterfly clamps can be performed by the fingers. However, in accordance with the present invention, if the handle 23 is swung forwardly beyond its normal stroke, due to the fact that the arm 31 is more remote from the center of oscillation 19 than the arm 29, the extension 33 will engage the gripping plate 27 as illustrated in FIG. 4 and push the gripping plate into a position parallel with the body 24. Also, this is effective to move the hub 25 of the second butterfly clamp into engagement with the gripping plate 20 as illustrated in FIG. 4, causing it to assume a parallel position to the body 17. In this manner, by swinging the handle 23 into its extreme forward position, that is beyond the position normally occupied by the handle in elevating the foot and leg rest, both butterfly clamps can be simultaneously opened thereby releasing the brace 15 and allowing the foot and leg rest to descend by gravity.

From the above-described construction it will be appreciated that merely by the addition of a second butterfly clamp and a handle 23, together with the two arms 29 and 31, the foot and leg rest can be elevated by the invalid while seated in the chair. Furthermore, if the handle 23 is swung into its extreme forward position the same handle that is used to elevate the foot and leg rest can be caused to effect a release of the foot and leg rest and allow it to descend.

Various changes may be made in the details of construction without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A chair having a foot and leg rest swingably mounted thereon, a brace operatively connected to the foot and leg rest for holding it in upwardly swung position, one-way grip means mounted on the chair engageable with the brace permitting the brace to move in a direction to elevate the foot and leg rest but normally preventing movement of the brace in the reverse direction, a handle mounted on the chair for back and forth movement relatively thereto, and one-way grip means operatively connected to the handle engageable with the brace to move the brace in a direction to elevate the foot and leg rest when the handle is moved in one direction, but to slide

relative to the brace when the handle is moved in the other direction.

2. A chair having a foot and leg rest swingably mounted thereon, a brace operatively connected to the foot and leg rest for holding it in upwardly swung position, one-way grip means mounted on the chair engageable with the brace permitting the brace to move in a direction to elevate the foot and leg rest but normally preventing movement of the brace in the reverse direction, a handle mounted on the chair for back and forth movement relatively thereto, and one-way grip means operatively connected to the handle engageable with the brace to move the brace in a direction to elevate the foot and leg rest when the handle is moved in one direction but to slide relative to the brace when the handle is moved in the other direction, the first-mentioned one-way grip means having a gripping means movable into a position releasing the brace arranged to be engaged by the second-mentioned one-way grip means and caused to release the brace when the handle is swung into an extreme position.

3. In combination, with a swingably mounted foot and leg rest of a wheel chair a handle mounted for back forth movement on the chair, means connecting the handle and the foot and leg rest for raising the foot and leg rest upon normal back and forth movements of the handle and for releasing the foot and leg rest for lowering when the handle is moved to an extreme position beyond the normal back and forth movements of the handle.

4. A foot and leg rest construction for wheel chairs comprising a swingably suspended foot and leg rest, a brace pivotally mounted thereon, one-way grip means mounted on the chair engageable with the brace permitting the brace to move relatively thereto in one direction to raise the foot and leg rest but normally preventing movement of the brace in the reverse direction, a handle mounted on the chair for back and forth movement relatively thereto and one-way grip means operable by the handle engageable with the brace to move the brace relative to the chair and relative to the first-mentioned one-way grip means to elevate the foot and leg rest.

5. A foot and leg rest construction for wheel chairs comprising a swingably suspended foot and leg rest, a brace pivotally mounted thereon, one-way grip means mounted on the chair engageable with the brace permitting the brace to move relatively thereto in one direction to raise the foot and leg rest but normally preventing movement of the brace in the reverse direction, a handle mounted on the chair for back and forth movement relatively thereto and one-way grip means operable by the handle engageable with the brace to move the brace relative to the chair and relative to the first-mentioned one-way grip means to elevate the foot and leg rest, and means whereby both one-way grip means can be caused to release the brace to allow descent of the foot and leg rest.

6. A foot and leg rest construction for wheel chairs comprising a swingably suspended foot and leg rest, a brace pivotally mounted thereon, one-way grip means on the chair engageable with the brace permitting the brace to move relatively thereto in one direction to raise the foot and leg rest but normally preventing movement of the brace in the reverse direction, a handle mounted on the chair for back and forth movement relatively thereto and one-way grip means operable by the handle engageable with the brace to move the brace relative to the chair and relative to the first-mentioned one-way grip means to elevate the foot and leg rest, and means operable by moving the handle to an extreme position for causing both of said one-way grip means to release the brace and allow descent of the foot and leg rest.

7. A foot and leg rest construction for wheel chairs comprising a swingably suspended foot and leg rest, a brace pivotally mounted thereon, one-way grip means pivotally mounted on the chair engageable with the brace

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permitting the brace to move relatively thereto in one direction to raise the foot and leg rest but normally preventing movement of the brace in the reverse direction, a handle mounted on the chair for back and forth movement relatively thereto and one-way grip means operable by the handle engageable with the brace to move the brace relative to the chair and relative to the first-mentioned one-way grip means to elevate the foot and leg rest, and means operable by the handle for causing the one-way grip means operable thereby to release the brace and also cause the first-mentioned one-way grip means to release the brace and allow descent of the foot and leg rest.

8. A foot and leg rest construction for wheel chairs comprising a swingably suspended foot and leg rest, a brace pivotally mounted thereon, one-way grip means on the chair engageable with the brace permitting the brace to move relatively thereto in one direction to raise the foot and leg rest but normally preventing movement of the brace in the reverse direction, a handle mounted on

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the chair for back and forth movement relatively thereto and one-way grip means pivotally mounted operable by the handle engageable with the brace to move the brace relative to the chair and relative to the first-mentioned one-way grip means to elevate the foot and leg rest, and means operable by the handle for causing the one-way grip means operable thereby to release the brace and to move into engagement with the first-mentioned one-way grip means and cause it to also release the brace and allow descent of the foot and leg rest.

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