June 25, 1957 J. F. WOMBLE 2,796,916

FOLDING WALKING AID

Filed June 10, 1954

Fig. 1.

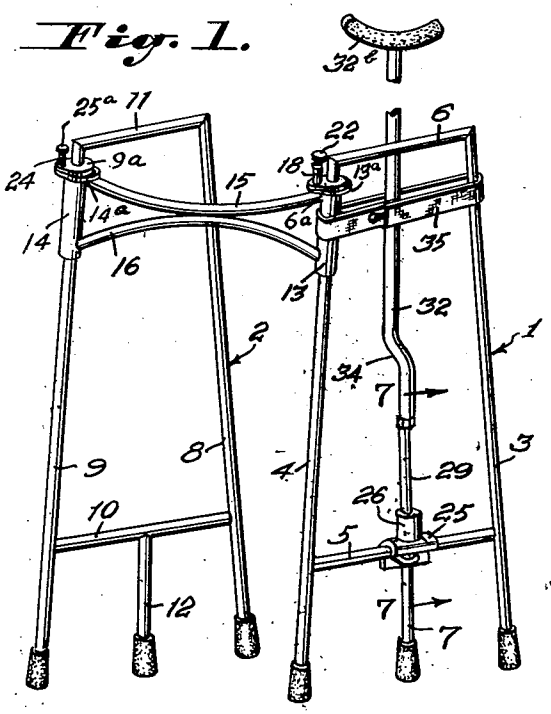


Fig. 2.

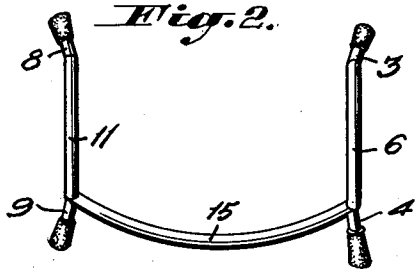


Fig. 4.

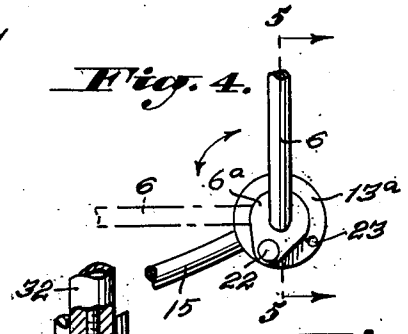


Fig. 5.

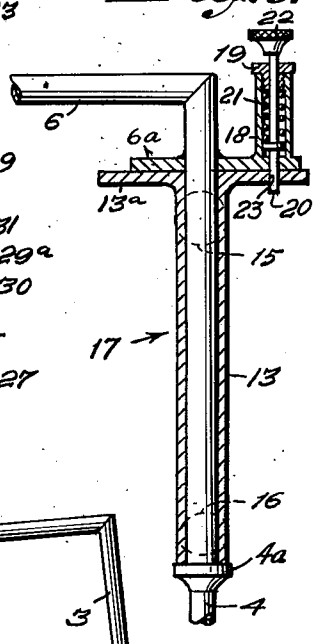


Fig. 6.

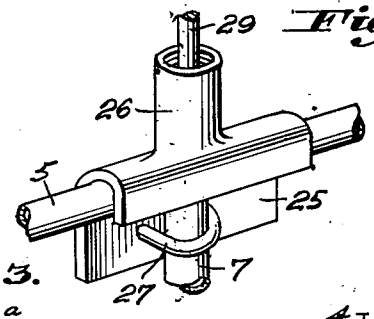


Fig. 7.

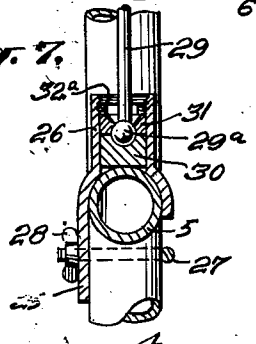
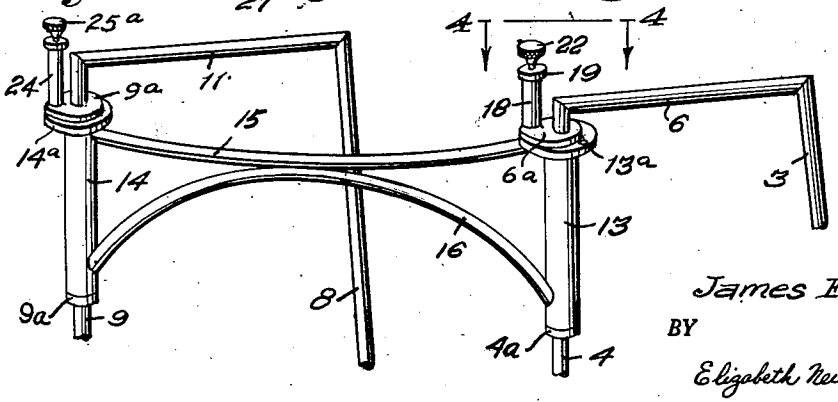


Fig. 3.



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FOLDING WALKING AID

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8 Claims. (Cl. 155—22)

This invention relates to a walking aid to assist persons who have, temporarily or permanently, lost the full use of their lower limbs, to move about unassisted and to engage in exercises which will help the user to reacquire muscular control and full use of the limbs.

It is the main purpose or object of the invention to provide an aid of the nature described which is useful and usable over a wide range of conditions of use.

A still further object is to provide a walking aid which is strong yet light in weight and which can be folded when not in use, into a relatively compact form for easy transportation and minimum space requirement.

Another object is to provide a device as in the preceding paragraph which is positively but releasably locked in both open and folded positions.

A further object is to provide a device of the nature described in which one or two crutches are supported for universal pivotal movement about points near the floor or supporting surface when required by the conditions of use and which can be readily detached or dispensed with when not required.

A still further object is to provide a walking aid which is relatively easy to fabricate, adaptable to a wide range of uses and a general advance in the art.

The nature of the invention will be apparent after a study of the detailed description in connection with the accompanying drawings.

In the drawings:

Figure 1 is a perspective view of the walker with one crutch attached thereto.

Figure 2 is a top plan view corresponding to Figure 1 and showing more particularly the arched braces connecting the two sides of the walker.

Figure 3 is a detail perspective view showing the manner in which the two sides are pivoted to the connecting braces for adjustment between extended and folding positions.

Figure 4 is a detail plan view of the mechanism for securing the sides of the walker in a selected one of two positions, namely, folded and extended.

Figure 5 is a sectional detail view to an enlarged scale, taken in a plane identified by the line 5—5 of Figure 4.

Figure 6 is a perspective view of the means for detachably mounting the universal crutch joint upon one of the lower struts, and

Figure 7 is a detail sectional view in a plane identified by line 7—7, Figure 1.

Referring in detail to the drawing, numerals 1 and 2 identify generally a pair of identical side frames of light tubular material of steel, aluminum or magnesium. Thus, frame 1 includes main upright members or legs 3 and 4 joined near the base by brace 5, and at the top by brace 6. Due to the fact that brace 6 is a little shorter than brace 5 the two legs or uprights 3 and 4 converge slightly toward the top as clearly shown upon Figure 1, to define the sides of a trapezoid. An additional shorter leg 7 is united at its upper end with the midportion of brace 5 and depends downwardly therefrom in the plane of

members 3 and 4, to terminate in a straight line connecting the lower ends of these members. The leg 7 has a distance from each of the main legs a little less than the width of a standard stair tread, whereby to facilitate and assist a user in going up and down stairs as will be subsequently explained. In view of the fact that the two side frames are identical, it is sufficient to identify the elements of frame 2 as main upright members 8 and 9, lower brace 10, upper or top brace 11, and short intermediate leg 12. The elements of each frame are rigidly united into a strong integral structure, in any suitable and well known manner, such as welding.

The two side frames 1 and 2 described in the preceding paragraph, are pivotally related by a structure which includes a pair of generally parallel sleeves 13 and 14, interconnected in spaced relation by tubular transverse arched struts 15 and 16. Strut 15 is arched forwardly and lies in a substantially horizontal plane, that is, a plane parallel with upper braces 6 and 11. See Figure 2. Strut 16 is arched forwardly and upwardly. The struts are tangent at their mid portions and are there integrally united to impart rigidity to the structure. Due to the fact that the struts are curved forwardly, additional room is afforded for forward movement by a user when positioned between the side frames.

One of the two identical swivel joints is indicated generally at 17, Figure 5, and best shown therein. From this view it will be noted that upright 4 has an integral enlargement 4*a* forming an abutment or stop for the lower end of sleeve 13 rotatably fitted thereabout. This sleeve at its upper end a short distance above the contiguous end of strut 15, terminates in a flat flange 13*a*. If desired, enlargement 4*a* may be a collar pinned to or threaded upon the upright 4 and hence removable to facilitate assembly of the apparatus.

A flat locking plate 6*a* which may conveniently be of oval outline is integrally connected with upright 4 in position to have a smooth fit against the flat top of flange 13*a*. The plate 6*a* has a tube 18 secured in upstanding position thereon radially spaced from member 4. The top end of the sleeve is closed by a centrally apertured cap or plug 19 which thus acts as an upper guide for a plunger pin 20. This plunger is yieldingly urged to a downward or lower position by a coil spring 21 within the sleeve acting between plug 19 and a collar secured to the plunger within the sleeve. An operating knob 22 is fixed to the top end of the plunger.

A pair of holes one of which is identified at 23, Figure 4, to receive plunger pin 20 with a smooth fit, are provided in flange 13*a* and are so located that the corresponding side frame 1 may be releasably held in either extended position as shown upon Figure 1, or a folded position as indicated in dotted lines upon Figure 4. In the folded position the side frames are generally coplanar with the struts 15 and 16 so that the entire instrument is compactly arranged for storage, shipment, or conveyance from place to place. Furthermore, in both positions, the side frames are positively and securely locked in that position until released by an upward pull on knob 22.

As the two releasable locks are duplicates in structure and operation, it is sufficient to identify, in addition to sleeve 14, flange 14*a*, Figure 3, enlargement 9*a*, tube 24, and knob 25*a*.

One or both of the lower braces 5 and 10 may mount a crutch. The means for accomplishing this comprise a bracket 25 in the general form of a flat plate curled at its top edge to fit downwardly over either of the braces 5 and 10. A socket 26 is integral with the bracket and rises from the central portion thereof. The combined bracket and socket are clamped to the central or short leg 7 or 12, by a U-bolt 27 which encircles the leg and passes through spaced holes in the bracket. Clamping

is effected by a pair of wing nuts **28**, one of which is shown upon Figure 7. When these nuts are turned down the bracket and its socket are firmly fixed in position upon brace **5** or **10**.

The socket **26** forms a receptacle for a universal joint comprising a ball enlargement **29***a* on the lower end of a rod **29**. The ball is universally mounted by and between lower and upper half-nuts **30** and **31**, held in cooperative relation by a ring **32***a* threaded into the upper end of socket **26**, as will be obvious from inspection of Figure 7. By this construction the rod **29** can take a downward thrust while being universally movable about the center of the ball.

The upper end of the rod **29** has a threaded connection with the lower end of a crutch stem **32**, Figure 7. A lock nut **33** secures the rod in rotated position of adjustment whereby the effective height of the arm rest **32***b* of the crutch may be varied. From Figure 1 it is noted that the stem **32** has a lower offset inwardly at **34**. It also has an equal and opposite offset not shown, near the top of the stem. This offset provides for use of the crutch without interference with the user's hand resting upon brace **6** or brace **11**, or both where two of the crutches are used. A band of rubber or elastic **35** is tensioned about the upper ends of the uprights **3** and **4** and as it extends upon opposite sides of the crutch stem, holds the crutch in usable position at all times.

The operation will be generally clear from the foregoing description. Assuming the device to be folded with the side frames **1** and **2** resting against the concave sides of the struts **15** and **16**, the frames are released by a pull on knobs **22** and **25***a* to release the plungers from the locking holes. Thereafter, the frames are swung to the open position and, when these have been rotated to proper position, they are automatically locked by springs **21** which force plungers **20** into the respective holes **23** corresponding to the open positions. The user then grasps the struts **6** and **11**. He then moves the walker forwardly to an advanced position a distance which may be substantially equal to the length of the steps taken. Due to the arched or bowed shape of the braces **15** and **16**, the user is enabled to advance a considerably greater distance than otherwise would be possible; and since the side frames in effect are folded or collapsed within the concave of the braces, a more compact package is formed when the parts are folded, than would otherwise be possible.

When additional support is needed from one or both shoulders, brackets **25** are attached by U-bolts **27** and wing nuts **28** in the manner obvious from the description and the height of the shoulder supports are suited to the user by loosening of lock nuts **33** and turning of the stems **32** until proper height is obtained. Thereafter the adjustment is secured by nuts **33** and elastic bands **35** are placed as shown. The use will be the same as previously described except that additional under-the-arm support will be afforded throughout the progress along the braces **6** and **11**.

The elastic bands **35** maintain the crutches from falling inwardly when temporarily released and assure that they will be maintained in position for ready use when needed. It will be further noted that the offsets in stems **32** of the crutches, provide a space between the stems and the braces **6** and **11** so that the crutches as they move along do not interfere with the hands of the user as they grasp the braces. One or both crutches moreover are easily and quickly detached when not used. The walker may be folded either with or without the crutches in position.

I have therefore provided a walking aid which fulfills all of the objects previously mentioned and which is a boon to those requiring permanent or temporary assistance in moving about by themselves and in reacquiring use of and strengthening muscles of the lower limbs.

While I have shown the form of the invention presently preferred by me, various modifications in construction will occur to those skilled in the art after a study of the foregoing disclosure. The disclosure should therefore be taken in an illustrative rather than in a limiting sense for it is my intention to reserve all modifications within the scope of the subjoined claims.

In the claims, the terms "vertical" and "horizontal" are definitive of the parts referred to, as they are positioned in actual use.

Having now fully disclosed my invention, what I clam and desire to secure by Letters Patent is:

1. A walking aid comprising right and left side frames each comprising front and rear tubular uprights, upper and lower straight substantially horizontal tubular braces rigidly connecting said uprights at the tops thereof and between the ends thereof, respectively, a third shorter upright rigidly connected at one end with the central portion of each of said lower braces and depending therefrom in the plane of said front and rear uprights, said third upright having its lower end colinear with the lower ends of the corresponding front and rear uprights, and means interconnecting said front uprights at the tops thereof only and in laterally spaced relation.

2. In a walking aid, right and left generally trapezoidal side frames each comprising a front and a rear upright and upper and lower braces rigidly connecting said uprights in spaced relation, each said upper brace forming a hand rest, each said lower brace being parallel with its upper brace and positioned between the ends of its uprights, the uprights and braces of each frame being coplanar, a pair of sleeves each being journaled on and about the upper portion of a respective front upright, a first forwardly bowed strut rigidly connecting the upper portions of said sleeves, a second forwardly and upwardly bowed strut connecting the lower portions of said sleeves, said struts being united at their mid portions, a locking plate integral with each sleeve and normal to the axis thereof, a guide integrally connected with each front upright in radially offset relation therewith for movement over its respective plate, a plunger mounted on each said guide for reciprocation parallel with its upright and adapted to enter a first aperture in said plate when the corresponding frame is folded against said struts and a second aperture in said plate when the corresponding frame is substantially at right angles to said struts, and spring means yieldingly urging each said plunger toward its plate.

3. In an aid for walking, right and left side frames, each said frame comprising a front and a rear upright, upper and lower horizontal braces rigidly connecting said uprights at their tops and adjacent their lower ends, respectively, a pair of legs each rigid with the central portion of a respective lower brace and extending downwardly to terminate colinearly with the lower ends of the corresponding pair of uprights, the uprights and leg of each said frame being coplanar, and forwardly and outwardly bowed struts interconnecting the upper portions of said front uprights in laterally spaced generally parallel relation.

4. In an aid for walking, right and left side frames, each said frame comprising a front and a rear upright, upper and lower braces rigidly connecting said uprights at their tops and adjacent their lower ends, respectively, legs each rigid with the central portion of a respective lower brace and extending downwardly to terminate colinearly with the lower ends of the corresponding pair of uprights, the uprights and leg of each said frame being coplanar, forwardly bowed struts interconnecting the upper portions of said front uprights in laterally spaced generally parallel relation, a crutch including a supporting stem adjustable in effective length, bearing means mounting the lower end of said stem for universal pivotal movement on the central portion of a lower brace, and resilient band means surrounding the upper portion of said uprights and confining said crutch stem between the passes thereof.

5. An aid for walking as recited in claim 4, said stem

having a central vertical portion offset from its coaxial upper and lower portions, said offset portion providing hand clearance between itself and the corresponding upper brace.

6. In a walking aid, right and left frames each comprising front and rear uprights, a generally horizontal first brace integrally connecting the top ends of each corresponding front and rear upright at hand level, and a second brace integrally connecting corresponding front and rear uprights intermediate their ends and below said first brace, a generally horizontal forwardly and outwardly bowed strut connecting the front uprights of said frames at substantially the level of said first braces, and a second upwardly and outwardly bowed strut connecting the front uprights of said right and left frames, said struts being mutually tangential at a point centrally thereof and rigidly interconnected at said point, said struts lying in the surface of a common cylinder having its vertical axis midway between said frames.

7. In a walking aid, right and left side frames, each comprising front and rear uprights, upper and lower substantially horizontal braces rigidly connecting said uprights at points adjacent the tops thereof and between the ends thereof, respectively, and a third upright secured to the central portion of said lower brace member and extending downwardly therefrom substantially in the plane of said front and rear uprights, to afford an auxiliary support for each said frame, and means interconnecting said

frames at the tops of said front uprights only, to hold said frames in fixed, parallel, laterally-spaced relation.

8. A walking aid as recited in claim 7, said last-named means comprising upper and lower, forwardly and outwardly bowed struts, said upper strut lying in a horizontal plane, said lower strut being arched upwardly and forwardly into tangential relation with said upper strut at a point central of said struts, said struts being rigidly interconnected at said point.

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