

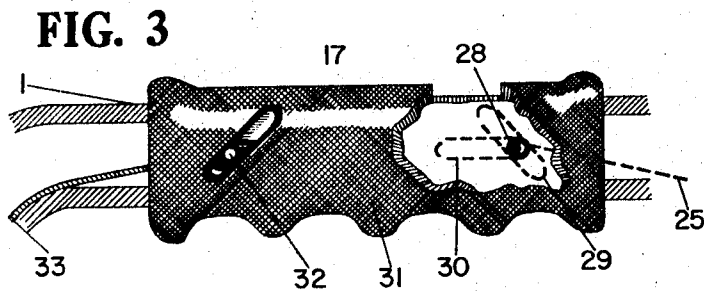
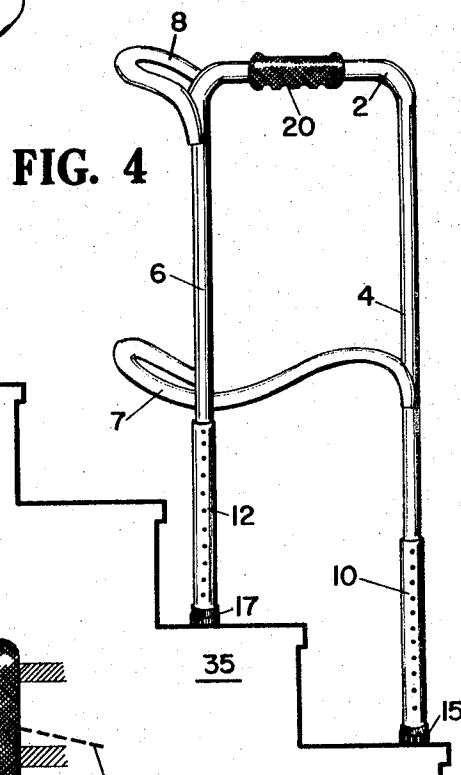
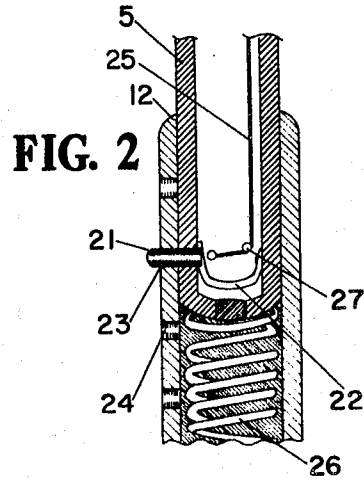
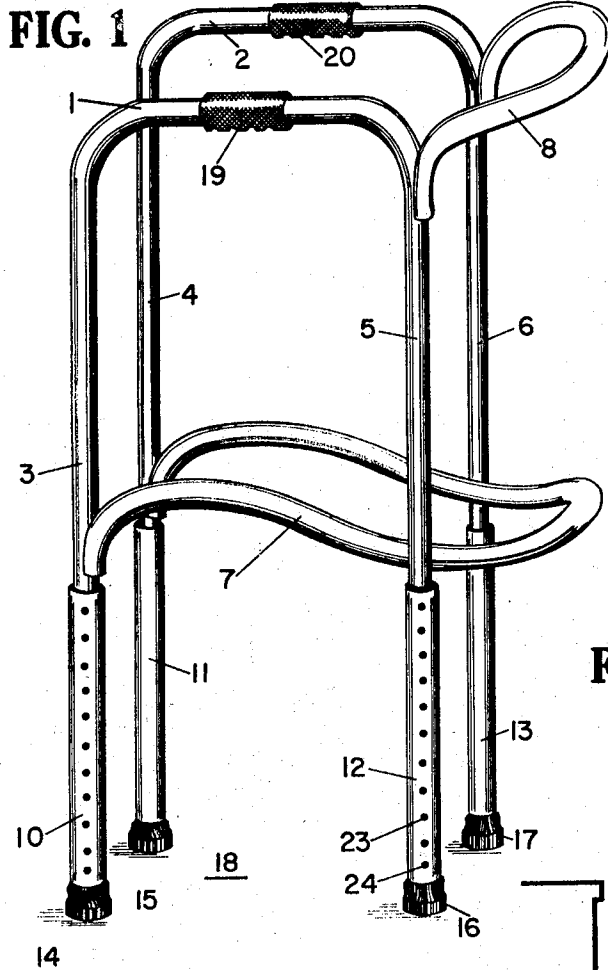
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WALKER FOR ASCENDING AND DESCENDING RAMPS AND STAIRCASES

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**WALKER FOR ASCENDING AND DESCENDING
RAMPS AND STAIRCASES**
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5 Claims

ABSTRACT OF THE DISCLOSURE

The present invention comprises a walker for the support of humans, said walker being suited to use in ascending or descending staircases and ramps, said walker comprising in combination,

- (a) a frame designed for supporting or steadying a human being,
- (b) three or more legs for supporting said frame an appropriate distance above the ground,
- (c) adjustment means for adjusting the length of at least one of said legs,
- (d) locking means for locking said legs at a desired length,
- (e) release means operably connected to said locking means to permit said locking means to be deactivated so as to permit adjustment of the length of said legs, said release means being located in such a position as to be operable by a human while said human is being steadied or supported by said frame.

Walkers are, of course, primarily used by injured or congenitally deformed persons to steady them or support them while they are walking or standing in a substantially erect position.

CROSS REFERENCES TO RELATED APPLICATIONS

The applicant knows of no other applications related to this application.

BACKGROUND OF THE INVENTION

Field of the invention

In recent years, walkers have found increasingly wide acceptance as a method for assisting and encouraging injured and deformed persons to move about in an erect position. Walkers provide more complete and more natural use of body muscles and avoid the training and soreness often attendant to the use of crutches and also the sores and muscular inactivity which may occur during prolonged operation of wheel chairs. Walkers may also be utilized by persons who, while they are not deformed nor seriously injured organically, may have lost sufficient muscular strength or muscular control so as to prevent their walking unattended. Because walkers normally have three or more support points resting on the ground, the balance necessary in the use of crutches is not required and therefore persons unable to use crutches can sometimes move about freely in walkers.

One disadvantage of walkers has been the difficulty or inability of conventional devices to permit movement up ramps or stairs. Whenever the support points could not be placed on approximately level ground the upper support frame of the walker was tilted sufficiently that the occupant would tend to lose balance and was frequently impeded by the walker rather than being assisted by it.

Description of the prior art

Some conventional walkers have had adjustable legs, particularly where leg adjustment was necessary to adapt the walker to the physical size of the human using it. How-

ever, while such walkers might permit uneven adjustment of legs to provide a level support frame while ascending or descending staircases or ramps, such adjustment could not be accomplished by the occupant of the walker while he is being steadied or supported by the frame. Thus, the occupant would have to leave the support of the walker, lean down and adjust the legs, then place the legs on the uneven ramp or staircase to be ascended or descended and then finally return to the walker and ascend the staircase. After ascending the staircase or ramp the occupant would then have to leave the support of the walker and readjust the legs. In most cases such operations would take more physical dexterity and strength than would climbing the staircase without assistance.

SUMMARY

The present invention embodies a frame which may be of conventional design for the support of the occupant. The frame is supported, in a manner which may be conventional, by three or more legs in order to provide stable support of the occupant by the frame without the need for balancing. At least some of the legs of the walker of the present invention are adjustable in length so as to permit the frame to remain substantially level and capable of supporting a human while the human ascends or descends ramps or staircases. It is an important feature of the present invention that the legs may be adjusted by the occupant himself while remaining within the walker in a position where he is supported or steadied by the frame of the walker. Thus, for the first time, to the best of my knowledge, a walker is provided which permits a person of limited physical strength or dexterity to ascend or descend staircases while at all times maintaining the steadying or supporting action of the walker. As described in the discussion and embodiments which follow, this important feature permits free motion of many persons who would otherwise be unable to cope with the staircases and ramps encountered in normal living and accomplishes this advantage without major increase in complexity or expense.

In brief, the present invention by providing walkers capable of leg adjustment without need for the occupant to leave the support of the walker, permits a stable base of at least 2 support points to be provided on a given step of a staircase while at least 1 support point is maintained on a different step which is higher or lower than the first, whereby the total effect of the three or more support points is to maintain a frame which supports the occupant in a stable position.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 shows a preferred embodiment of the invention assembled and resting on level ground.

FIGURE 2 is a detail of the locking mechanism which is preferred for the legs of walkers of the present invention and also shows spring means for biasing the legs of the walker toward the fully extended position.

FIGURE 3 is a detail of a preferred release mechanism for use with the walker of the present invention.

FIGURE 4 shows the walker of FIGURE 1 with the legs adjusted to an uneven position and resting on a staircase.

DESCRIPTION OF A PREFERRED EMBODIMENT

In FIGURE 1 the frame for steadying the human occupant of the walker consists of two horizontal members 1 and 2 which are supported by vertical members 3, 4, 5, and 6 extending from the ends of the horizontal members. Suitable cross braces 7 and 8 provide rigidity to the structure. These cross braces extend outward past the front vertical members 5 and 6 in order to provide space for the normal motions associated with walking. The vertical

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members 3, 4, 5, and 6 extend downward beneath cross brace 7 and there telescope into leg extension members 10, 11, 12, and 13, respectively. Conventional rubber "crutch tips" 14, 15, 16, and 17 are fitted to the lower ends of the leg extension members and in turn rest on the floor 18. Hand-operated releases 19 and 20 are provided in position where they may be actuated by an occupant of the walker without leaving the normal walking position. Release 19 releases leg extension members 10 and 12 and release 20 releases leg extension members 11 and 13.

FIGURE 2 shows the locking mechanism which holds the extension members 10-13 in the desired position. A pin 21 is biased outward by spring 22 so as to extend through a hole in vertical member 5 and engage one of the series of holes 23, 24, etc., in leg extension member 12. A cable 25 serves to pull the pin 21 backward into vertical member 5 and cause the pin to disengage from hole 23 thus releasing leg extension member 12 and permitting it to telescope with vertical member 5. A coil spring 26 biases leg extension 12 to the fully extended position. Suitable stop means (not shown) are provided for preventing leg extension means 12 from extending out of contact with vertical member 5.

Cable 25 is attached to the end of pin 21 so that it can pull against the biasing action of spring 22. Cable 25 extends around a direction changing pin 27 and thereafter extends upward through vertical member 5 to attach to pin 28 in hand-actuated release 20. Pin 28 rides within slots 29 and 30 and is suitably enlarged at its ends to maintain it in position within these slots. Slot 29 is cut into hand grip 31 while slot 30 is cut into horizontal frame member 1. Rotation of hand grip 31 in the direction shown by the arrow in FIGURE 3 therefore tends to move pin 28 in a direction which causes a pull on cable 25 which in turn retracts pin 21 releasing leg extension member 12 to permit it to telescope. Simultaneously pin 32 is by this same action moved in a direction so as to cause a pull on cable 33 which retracts a similar pin (not shown) and in turn releases leg extension member 10. A similar locking mechanism, biasing spring, etc. are provided in each of the legs and release 20 is constructed identically with release 19 except that release 20 controls leg extension members 11 and 13.

In operation, a person steps through the open portion of cross brace 7 and stands within the area outlined by the four legs with his hands and, if desirable forearms, resting on horizontal frame members 1 and 2 for support. He then walks forward on level ground 18 sliding the entire walker along with him and resting and leaning on the walker as necessary in his particular physical condition. On arriving at an ascending staircase the occupant tilts the walker back slightly on feet 14 and 15 thus raising legs 16 and 17 and positioning them on the top of the lowest step. The occupant then directs his weight more on feet 16 and 17 and simultaneously releases the legs by turning manually actuated releases 19 and 20 as directed by the arrow in FIGURE 3. Leg extensions 10 and 11 then extend to the position shown in FIGURE 4. When frame members 1 and 2 are comfortably level the occupant relocks legs 10 and 11 by releasing the hand grips on releases 19 and 20. The occupant then places one foot on the next step, lifts the walker so that feet 14 and 15 rest on the next higher step, and proceeds as is comfortable for him, resting as necessary on horizontal members 1 and 2.

On reaching the top of the staircase the occupant similarly releases the legs so that leg extensions 10 and 11 retract until frame members 1 and 2 are again substantially horizontal. The leg extension members are then again locked and travel proceeds on the level as described previously.

Ramps are, of course, negotiated just as are staircases, and the above procedure is reversed in descending.

Many modifications to the invention is possible. For example, the walker may have three legs with only one

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being retractable or may have more than four legs if desirable because of some peculiar need of the patient. The legs may be individually retractable or may be retracted by releases which actuate a front pair of legs or a back pair of legs, where the occupant can more comfortably ascend sidewise the left or right pair may be extended or retracted. Frame members 1 and 2 may be higher so as to rest under the arms of the occupant. The leg extension means need not be separate but may instead be connected together by cross braces or may merely be the vertical portions of U-shaped elements. The releases can be located in the vertical members or in the cross braces or elsewhere if more convenient to their operation by a patient while he is being supported by the walker and may be actuated by foot or otherwise. While the walker will preferably be built from tubing, most preferably from tubular aluminum of about one inch diameter, angle members and even wood may be utilized. Obviously, the locking methods and releases described herein may be modified or replaced with a variety of alternative mechanisms without departing from the spirit of the invention.

All of the modifications and variations which would be apparent to persons skilled in the art upon a reading of the present specification are to be considered as being included within the claims appended hereto.

What is claimed is:

1. A walker for the support of humans, said walker being suited to use in ascending or descending staircases and ramps, said walker comprising in combination,

(a) a frame designed for supporting or steadying a human being, said frame comprising two substantially horizontal members designed for steadying or supporting a substantially erect human being, and having at least one open side between said substantially horizontal members,

(b) four or more legs for supporting said frame an appropriate distance above the ground,

(c) at least one pair of adjustable legs, each having adjustment means for adjusting their length, each of said adjustable legs comprising two vertically extending members telescoping one within the other, each of said adjustable legs of a pair being located in substantially the same position on a different substantially horizontal member of said frame,

(d) locking means for locking each of said adjustable legs at a desired length,

(e) manually operable release means operably connected to said locking means to permit said locking means to be deactivated so as to permit adjustment of the length of said legs, said release means being located on said substantially horizontal members of said frame so as to be operable by a human while said human is being steadied or supported by said frame.

2. The device of claim 1 wherein the locking means on said pair of adjustable legs are released by a single release means.

3. The device of claim 2 wherein spring means is provided to bias said legs to their fully extended position.

4. The walker of claim 3 wherein the locking means comprises a pin extending outward through a hole in the inner of said telescoping members so as to engage any of a series of holes drilled through the outer of said telescoping leg members, said pin being biased outwardly and being retractable to disengage from said holes in said outer leg member.

5. A walker for the support of human beings, said walker being suited to use in ascending or descending staircases and ramps, said walker comprising in combination,

(a) a frame designed for supporting or steadying a human being, said frame comprising at least two horizontal members designed for steadying or supporting any substantially erect human being,

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- (b) three or more legs for supproting said frame an appropriate distance above the ground,
- (c) adjustment means for adjusting the length of at least one of said legs, each of such adjustable legs comprising two vertically extending members telescoping one within the other,
- (d) locking means for locking said legs at a desired length, comprising a pin extending outward through a hole in the inner of said telescoping members so as to engage any of a series of holes drilled through the outer of said telescoping leg members, said pin being biased outwardly and being retractable to disengage from said holes in said outer leg member,
- (e) release means operably connected to said locking means to permit said locking means to be retracted so as to permit adjustment of the length of said legs, said release means being located in such a position as to be operable by a human while said human

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is being steadied or supported by said frame, said release means comprising at least one hand grip and at least one cable, said hand grip being operably connected so that movement of said hand grip exerts tension in said cable and said cable being operably connected to cause said pin in said locking mechanism to retract when said cable is under tension.

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