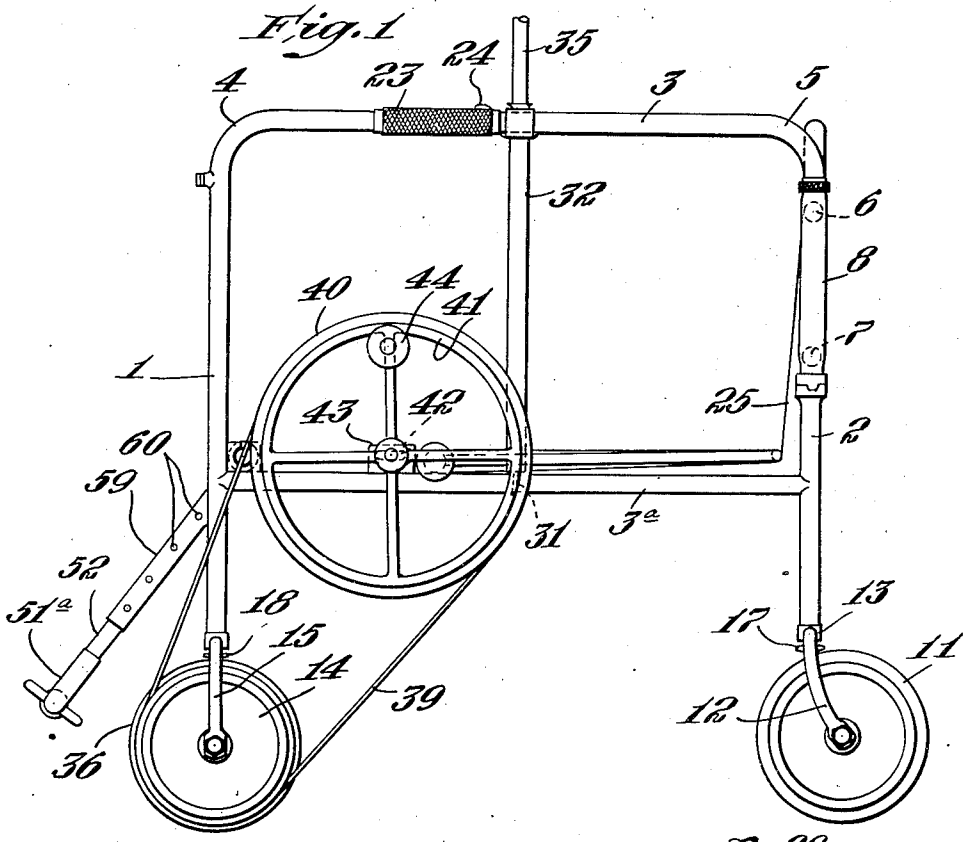
May 10, 1949. B. AMES 2,469,359

PORTABLE SUPPORT

Filed Jan. 24, 1945 3 Sheets-Sheet 1

Fig. 1



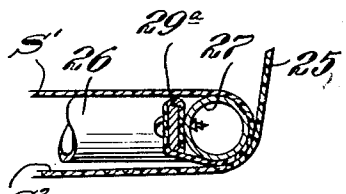


Fig. 4

Fig. 3

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May 10, 1949. B. AMES 2,469,359

PORTABLE SUPPORT

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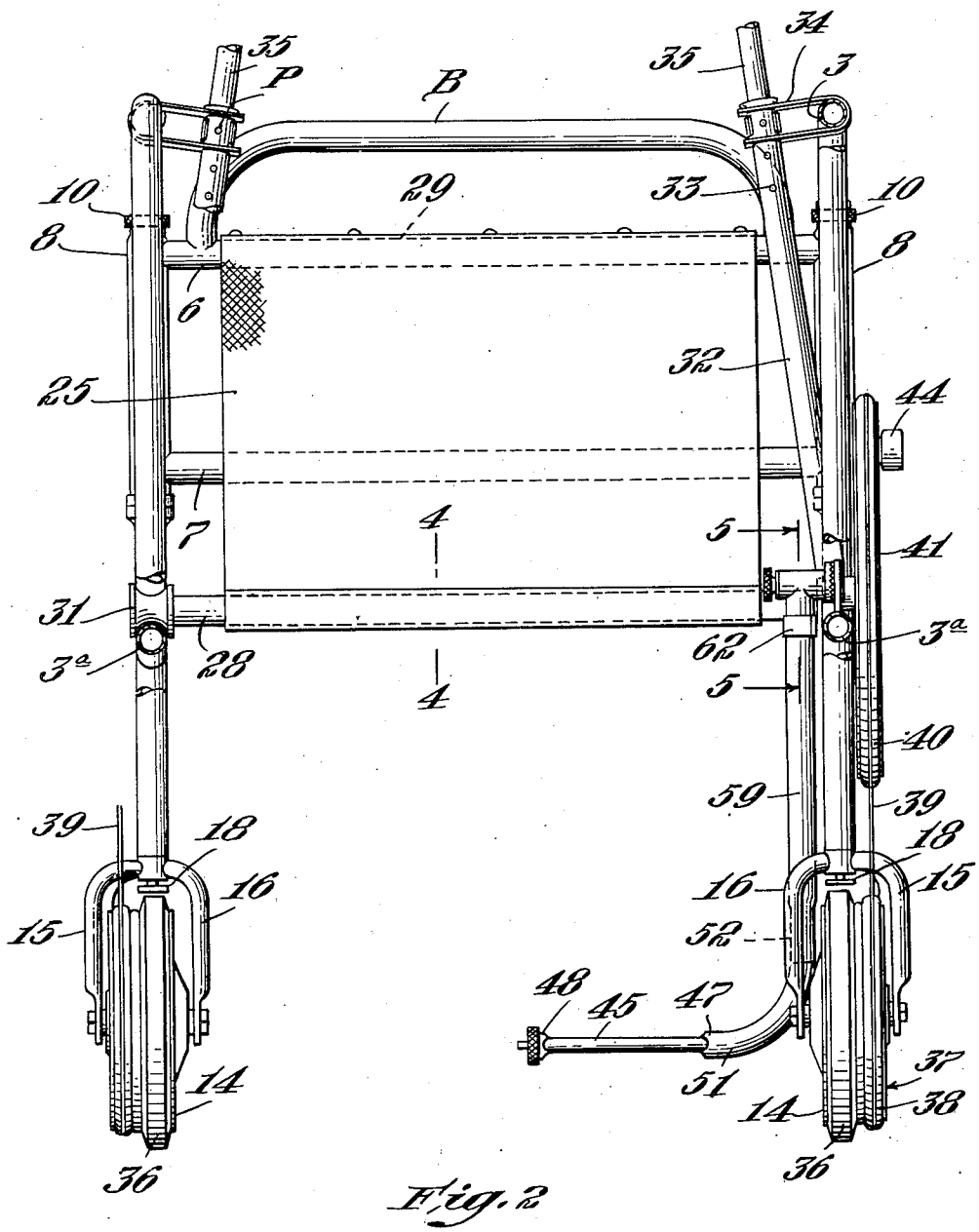


Fig. 2

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May 10, 1949. B. AMES 2,469,359

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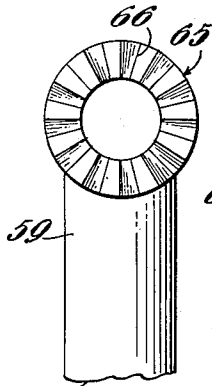


Fig. 7

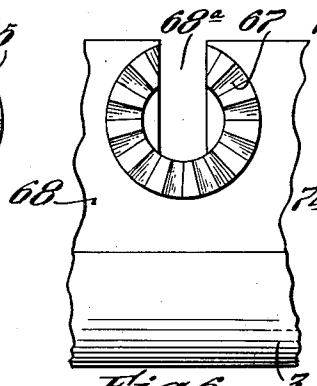


Fig. 6

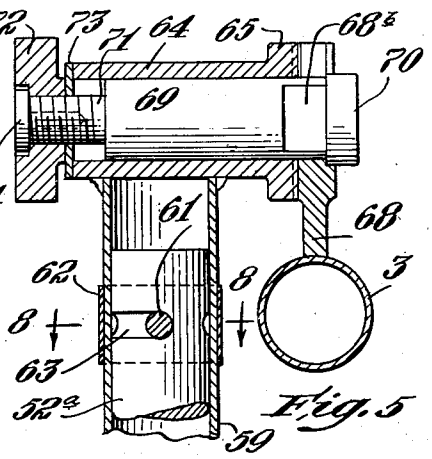


Fig. 5

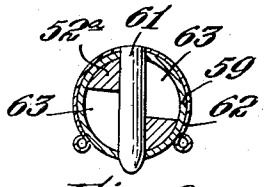


Fig. 8

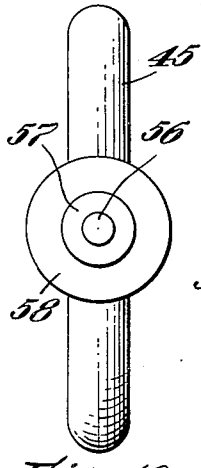


Fig. 10

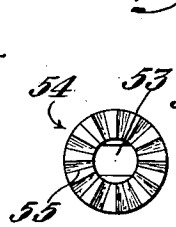
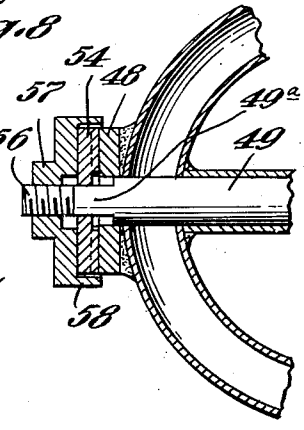


Fig. 11



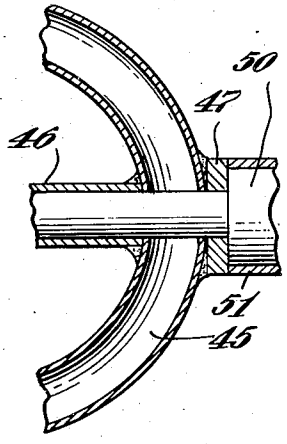


Fig. 9

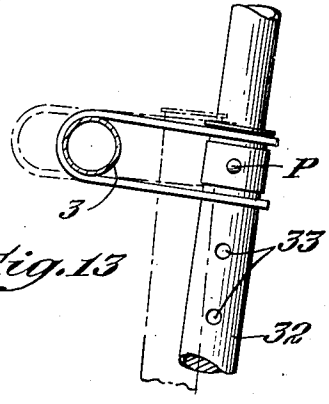


Fig. 13

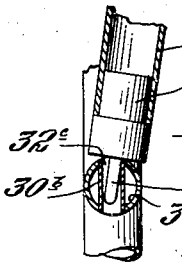


Fig. 12

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Patented May 10, 1949 2,469,359

UNITED STATES PATENT OFFICE

2,469,359

PORTABLE SUPPORT

Butler Ames, Boston, Mass.

Application January 24, 1945, Serial No. 574,364

1 Claim. (Cl. 280—211)

1

This invention pertains to portable supports for individuals unable to walk or to bear their full weight on their legs, for example persons who have lost the use of one or both legs; aged people; or convalescents, and relates more especially to an improved support of the kind disclosed in the U. S. Patent to Ames No. 2,282,689, dated May 19, 1942, and in copending applications for Letters Patent, Serial No. 520,745, filed February 2, 1944, now Patent No. 2,437,778, granted Mar. 16, 1948, and Serial No. 541,908, filed June 24, 1944.

A support of the kind to which the present invention relates comprises two substantially rigid supporting units normally disposed in spaced substantially parallel relation and between which the user stands or sits, and a back to which both units are hinged so that the entire device may readily be folded into compact form for transportation. The frames of the supporting units and back are in general similar to the corresponding parts of the patented device, preferably being made of stiff and light but rigid tubing. The top or hand-supporting bar or rail of each supporting unit is preferably integrally continuous with the front and rear legs of the respective units, while the lower stretcher bar of each supporting unit is welded to the legs, the contituent bars of the back likewise being welded together. The hinge connections between the supporting units and the back are likewise in general similar in structure and function to the corresponding portions of the patented device, being so designed as to permit the supporting units to be swung through arcs of approximately 180° and placed in parallel relation to the back so as to form a very compact structure easily carried and requiring but little space for storage.

While in the patented device the support is provided with skids at its rear end and with wheels at the front, the present invention contemplates the provision of wheels at both front and rear, the wheels at the rear being swiveled to facilitate steering the device. Moreover, as in the device of the above-named copending applications, brake means is provided whereby the user may more readily and certainly control the movement of the support, each of the four wheels preferably being provided with a brake, and the brakes for the wheels of each unit, respectively, being independently controlled by a conveniently located hand-actuated element.

Moreover, as in the devices of the aforesaid applications, the present invention contemplates the provision of crutch-supporting staffs conveniently adjustable and carried by the supporting units so that the user may rest his weight upon the crutches and easily and rapidly propel the support, for example, by contact of one foot with the ground.

2

Furthermore, as in the last named application, the present invention contemplates the provision of means whereby the support may be propelled by a person totally unable to walk, for instance a person who has lost the use of both legs.

Objects of the present invention are to provide improved means for manually propelling the support; to provide improved foot-supporting means for the feet of the user when seated in the support; to provide an improved seat structure; and to provide improved means for mounting crutch staffs in the support.

Other and further objects and advantages of the invention will be pointed out in the following more detailed description and by reference to the accompanying drawings wherein:

Fig. 1 is a side elevation of the improved support showing one of the crutch staffs in place but broken off;

Fig. 2 is a front elevation of the support, to larger scale than Fig. 1 but with certain parts broken away, omitted, or in section;

Fig. 3 is a fragmentary side elevation, with parts in vertical section, to somewhat larger scale than Fig. 1, illustrating the seat structure;

Fig. 4 is a fragmentary section substantially on the line 4—4 of Fig. 2, and to larger scale, showing details of the seat structure;

Fig. 5 is a fragmentary vertical section, to larger scale, substantially on the line 5—5 of Fig. 2;

Fig. 6 is a fragmentary elevation showing the inner side of the foot rest supporting bracket;

Fig. 7 is a fragmentary elevation showing the upper end of the foot rest supporting arm;

Fig. 8 is a horizontal section substantially on the line 8—8 of Fig. 5;

Fig. 9 is a fragmentary plan view, partly in horizontal section, showing a preferred form of foot rest;

Fig. 10 is an elevation of the foot rest of Fig. 9, viewed from the left-hand side of the latter figure;

Fig. 11 is an elevation of a clutch element forming a part of the foot rest structure;

Fig. 12 is a fragmentary elevation partly in vertical section, showing the lower end of the supporting sleeve for the crutch-staff; and

Fig. 13 is a fragmentary elevation, showing the upper part of one of the crutch-staff supporting sleeves.

As in the patent above referred to and in said copending applications, the portable support of the present invention is of foldable type so that it may be compactly arranged for ease in transporting and storing it, but when in use is rigid and affords adequate support for the occupant.

As herein illustrated, the support comprises two substantially like supporting units which, when the device is in use, are disposed in substantially parallel vertical planes and which are united by a rigid back member. Each of these supporting units comprises front and rear legs 1 and 2 (Fig. 1), preferably made of stiff, rigid but thin metal tubing; a top or hand-supporting bar 3, preferably approximately horizontal and which is united by smooth bends 4 and 5 with the upper ends of the legs 1 and 2; each side unit also comprising a rigid stretcher bar 3a spaced below the hand-supporting rail 3 and preferably parallel to the latter and which is rigidly united, for example, by welding at its opposite ends, to the legs 1 and 2. The back (Fig. 2) also comprises vertically spaced upper and lower, substantially horizontal bars or rails 6 and 7 which are rigidly united, as by welding at their opposite ends, to hinge sleeves 8 (Figs. 1 and 2) forming bearings within which the rear legs 2 of the supporting units may turn. The sleeves, with the portions of the legs which they embrace, constitute hinge connections between the back and supporting units. Preferably these hinge connections are of the kind more fully disclosed in the aforesaid patent to Ames, No. 2,282,689, being so devised that when the knurled hand nut 10 (Fig. 2) is loosened, the sleeves may be turned relatively to the legs 2 to permit the two supporting units to be swung so as to lie in substantially parallel planes. When, on the other hand, after having disposed the supporting units in operative relation, the nuts 10 are tightened, the hinge connections are locked so as to hold the two supporting units in substantially parallel operative relation and at right angles to the plane of the back.

In the present arrangement a bow-shaped back rest B is fixed to the rail 6, the transverse member of the back rest preferably being approximately in the same horizontal plane as the hand-supporting bars 3 of the supporting units.

Each rear leg 2 is provided with a supporting wheel 11 (Fig. 1) preferably having a resilient tire, the wheel bearings being supported in rigid fork arms 12 projecting from a hub 13 which has a swivel connection with the lower end of the respective leg 2. Each front leg 1 is also provided with a supporting wheel 14, arranged to turn in the vertical front-to-rear plane of the axis of the leg, the bearings of each front wheel being mounted in the lower ends of fork arms 15 and 16 (Figs. 1 and 2) which are fixed, for example, by welding to the lower end of the corresponding leg.

The seat 25 (Figs. 3 and 4) consists of a length or panel of flexible material, for instance heavy textile fabric. In accordance with the present invention, a substantially rigid seat frame is provided, comprising parallel side bars 26 united to a rear bar 27 (Fig. 4) and a front bar 28 (Fig. 3), the several bars of this seat frame preferably being of stiff and thin metal tubing united, for example, by welding. One end of the flexible panel 25 is secured, for example, by means of a cleat 29 (Fig. 3) to the rail 6 of the back of the support, the flexible panel then extending downwardly beneath the rear bar 27 of the seat frame, thence forwardly about the front bar 28, thence rearwardly, then down and about the rear bar 27, its

end being secured by a cleat 29a to the bar 27. By this arrangement the supporting portion of the seat comprises two thicknesses of flexible material, and the rigid frame keeps these two thicknesses substantially flat, thus providing a comfortable seat for the occupant.

As illustrated in Fig. 2, the front bar 28 of the seat frame extends laterally beyond the edges of the seat panel, and at its opposite ends is provided with spool-shaped members 31 designed respectively to rest upon the lower rails 3a of the supporting units. This arrangement holds the front bar 28 of the seat in proper relation to the spaced, supporting units when in use, but likewise permits the front bar 28 readily to be lifted from the rails 3a when it is desired to fold the seat. Thus the front bar 28 may be swung upwardly, substantially about the rear bar 27 as an axis, and then, by tipping the front bar 28, its opposite spool ends 31 may be caused to rest upon the upper rails 3 of the respective supporting units, preferably upon the downwardly curving portions 5 of the rails 3, with the middle portion of the bar 28 bearing against the bar B of the back rest, thus securely holding the seat in folded position when not in use.

As described in the aforesaid copending application, Serial No. 541,908, a crutch-staff supporting sleeve or holder 32 (Figs. 1, 12 and 13) may be associated with each of the supporting units. In accordance with the present invention, each of these sleeves or holders 32 is closed at its lower end by means of a plug 32a (Fig. 12) having a downwardly directed toe 32b which is designed to be entered into an opening 32c formed in the lower rail 3a of the corresponding supporting unit. Preferably a short piece of tube or tubular rivet 30b extends diametrically of the rail 3a coaxial with the opening 32c to provide a socket for the toe 32b. The toe 32b may readily be inserted in the socket or withdrawn as desired.

The upper portion of the sleeve or holder 32 is provided with a series of openings 33 (Fig. 2), the upper portion of the sleeve passing through aligned openings in the substantially parallel legs of a U-shaped bracket 34 (Figs. 2 and 13), the closed end of which embraces the upper or hand-supporting rail 3 of the corresponding supporting unit. The parallel legs of the bracket 34 are so spaced that the bracket may slide freely on the rail 3, thus the upper portion of the sleeve or holder 32 may be swung toward or from the rail 3 as indicated in broken lines in Fig. 13, the sleeve swinging freely about its lower end where the toe 32b seats in the socket 30b. The crutch-staff 35 telescopes within the sleeve 32 and is provided with a transverse opening designed to receive a pin P (Fig. 13), preferably secured to a spring clip removably engaging the upper end of the sleeve 32 between the arms of the bracket 34, the pin P being designed to engage any selected one of the openings 33 in the sleeve 32, thereby permitting vertical adjustment of the crutch-staff 35. Since the crutch-staff is mounted in the freely swinging sleeve 32, the upper ends of the crutch-staffs to which the arm rests (not shown) are secured may be moved toward and from each other so as to accommodate persons of different sizes.

Each front wheel 14 is preferably provided with a resilient tire 36, and each of these front wheels has associated with it a supplemental, coaxial wheel or disk portion 37 of less diameter than the main wheel and provided with a rim or tire 38 having a peripheral groove for the reception of an endless drive band 39, preferably a band of metal-

lic wire or cable, the fork arms 15 and 16 being spaced to accommodate the front supporting wheel 14 and its associated disk member 37. This drive band 39 also engages a groove in the rim or tire 40 of a manually actuable drive wheel 41 mounted to turn on a stud arranged for adjustment along a horizontal slot 42 (Fig. 1) formed in a bracket 43 fixed to the lower rail 3a of the correspnding supporting unit. Each of these drive wheels 41 is preferably furnished with a knob 44 at its outer side designed to be grasped by the hand of the operator to facilitate rotation of the drive wheel. The disk portion or wheel 37 is at the outer side of the corresponding front supporting wheel and in the vertical plane of the corresponding drive wheel 40. Thus the drive band 39 is exposed at the outside of the frame unit and may readily be applied or removed without breaking its continuity. Motion of the drive wheel is transmitted to the driven wheel or disk 37 by means of the endless band 39 and thus the corresponding front wheel 41 is turned thereby to propel the apparatus. Since the rear wheels 11 are swivelled to turn independently and freely and since the front wheels 14 may be driven at the same or different speeds or reversely from one another, it is thus readily possible for the operator to propel and steer the apparatus merely by proper manipulation of the two drive wheels 41.

Preferably, the support is provided with a pair of independent foot rests 45. Each of these foot rests is preferably of generally elliptical shape in plan view (Fig. 9) and comprises a rim portion of hollow tubing and a transversely extending portion 46 also of hollow tubing and extending along the major axis of the ellipse, the part 46 preferably being welded at its opposite ends to the rim. Preferably annular members or washers 47 and 48 are welded to the outer surfaces of the rim at diametrically opposite ends of the rim and in coaxial relation to the member 46, the annular members 47 and 48 having outer surfaces lying in planes substantially perpendicular to the axis of the part 46.

A spindle 49 extends through the part 46 and through aligned openings in the rim of the foot rest, one end of the part 49 being integral with or permanently united to a plug 50 which is disposed within and permanently united, as by welding, to the lower substantially horizontal leg 51 of an angle member formed of thin stiff tubing having a substantially vertical leg 51a in which is fixedly secured the lower end of the elongate supporting stem 52.

The opposite end of the spindle 49 is preferably flattened or slabbed off on opposite sides, as shown at 49a and passes through a substantially rectangular slot 53 in a clutch disk 54. This clutch member 54 (Fig. 11) has radial teeth 55 on its inner face designed to engage similar teeth on the outer radial face of the annulus 48, the latter being fixed as by welding to the rim of the foot rest as above described. The outer end portion of the spindle 49 is screw threaded at 56 and receives an internally screw-threaded nut 57 having a rim portion 58, preferably knurled for manual manipulation of the nut. By screwing this nut 57 inwardly along the spindle 49, the clutch member 54 may be engaged with the teeth on the part 48, thus locking the foot rest to the spindle 49. On the other hand, by loosening the nut 57, the clutch disk 54 may be separated from the part 48, thus permitting the foot rest to be turned relatively to the spindle 49 so as to adjust

the foot rest to lie at any desired angle to the horizontal.

The foot rest supporting stem 52 is provided near its upper end with a solid plug 52a (Fig. 5) provided with a transverse aperture and with slots 63 extending into said aperture and extending peripherally of the plug for distances of approximately 105°. The stem 52, with its plug 52a, telescopes within a tubular member 59, having a series of spaced apertures 60 (Fig. 1) designed to receive a pin 61, (Fig. 5) preferably secured at one end to a spring clip 62 designed partially to embrace the member 59. By removing the spring clip and pin 61, parts 52 and 59 may be adjusted relatively to each other and may then be held in desired position of adjustment by inserting the pin 61 through any selected opening 60 and through the opening in the plug 52a. However, when the pin is thus in place, the part 52a may be turned relatively to the part 59 to the angular extent permitted by the slots 63. The position of the foot rest may thus be adjusted for the comfort of the occupant.

The upper end of the member 59 is rigidly secured, for example by welding, to sleeve member 64, provided at one end with radial clutch teeth 66 (Fig. 7) in its outer face. These clutch teeth are designed to engage similar radial teeth 67 (Fig. 6), formed on the inner surface of a bracket member 68, rigidly secured to the corresponding hand-supporting rail 3. A spindle 69 is arranged within the sleeve member 64 and is provided with a head 70 at one end of an external diameter somewhat greater than that of the body of the spindle 69. The bracket 68 is provided with a slot 68a extending downwardly from its upper edge and transversely of the annular series of teeth 67, the end portion of the spindle 69 just to the left of head 70 (Fig. 5) being slabbed off or flattened at 69b so that this end portion may be fit down into the slot 68a of the bracket 68. The opposite end of the spindle 69 is provided with a portion 71 of reduced diameter, externally screw threaded and engaged by a manually actuable nut 72, the inner end of the latter bearing against an annular plate or washer 73 closing the end of the sleeve 64. A screw 74 may be provided for holding the nut 72 in adjusted position. By loosening the nut 72, it is possible to move the sleeve 64 to the left as viewed in Fig. 5, so as to separate the clutch teeth 66 and 67, thus permitting the member 59 to be swung from front to rear about the axis of the spindle 69. When swung to the desired position, the nut 72 may be tightened thus holding the foot rest in the desired position of adjustment.

If it is not desired to use the foot rests, the nuts 72 may be loosened, and the foot rest stems 52 with the parts 59 swung upwardly and rearwardly until the foot rests engage the rear member of the support. If, at the same time the seat be folded back, the entire interior of the support is thus left free for an occupant who wishes to walk, either with the assistance of the crutches or merely by resting his hands on the top rails 3.

While certain desirable features of improvement and invention have herein been disclosed by way of example, it is to be understood that the invention is not necessarily limited to these specific features, but is to be regarded as broadly inclusive of any modifications and rearrangement of parts and the substitution of equivalents such as may fall within the scope of the appended claim.

I claim:

A foldable support, for invalid or similar use, of the kind which comprises a pair of supporting units, a rigid back of fixed width, hinge means connecting the back to each supporting unit, each unit including a hand rail and a stretcher bar spaced below and substantially parallel to the corresponding hand rail, each unit having front and rear supporting wheels, a swivel bracket for the rear wheel of each unit, said brackets being arranged to turn about substantially vertical axes, characterized in that the front wheel of each unit is mounted in a non-swiveling bracket comprising spaced fork arms providing supports for the opposite ends of a shaft on which the front wheel turns, a manually rotatable drive wheel mounted on the stretcher bar of each unit at the outer side of said unit, each drive wheel having a grooved rim, a driven wheel, of substantially less diameter than the drive wheel, fixed to the outer side of and coaxial with and of a diameter less than that of the front supporting wheel of the corresponding unit, each driven wheel being disposed in the vertical plane of the corresponding drive wheel, the fork arms of each front bracket being spaced apart to accommodate the front supporting wheel with its associated driven wheel, and an endless

drive band engaging the grooves of the drive and driven wheels of each unit, respectively, each manually rotatable drive wheel being provided at its outer side with a knob designed to be grasped by the operator for turning the drive wheel, each drive wheel being bodily adjustable relatively to the respective stretcher bar thereby properly to tension the drive band.

BUTLER AMES.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
134,733	Collins	Jan. 14, 1873
334,998	Wardell	Jan. 26, 1886
433,508	Akers	Aug. 5, 1890
503,105	Tingley	Aug. 8, 1893
692,036	Sawyer	Jan. 28, 1902
1,949,163	Kosten et al.	Feb. 27, 1934
1,972,557	Greene	Sept. 4, 1934
2,129,260	Bowser	Sept. 6, 1938
2,181,420	Everest et al.	Nov. 28, 1939
2,241,481	Schroeder	May 13, 1941
2,282,689	Ames	May 12, 1942