March 13, 1951 N. R. HENRY 2,544,957

CRUTCH

Filed Aug. 2, 1948

Fig. 1.

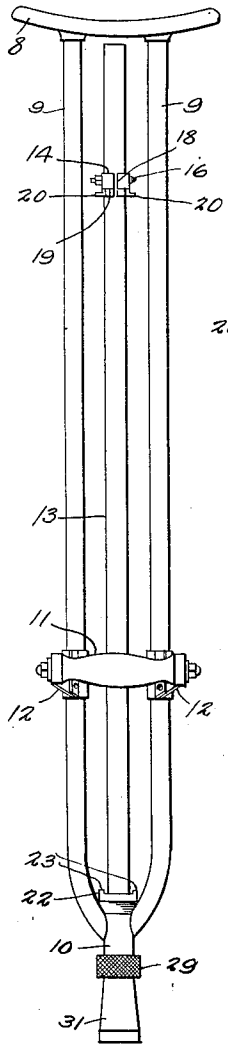


Fig. 3.

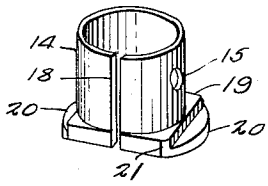


Fig. 4.

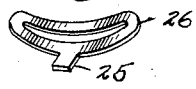


Fig. 5.

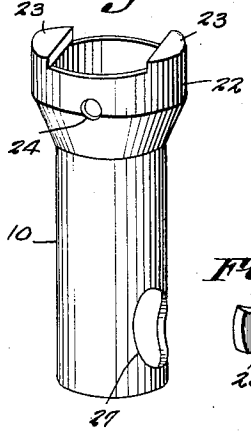


Fig. 2.

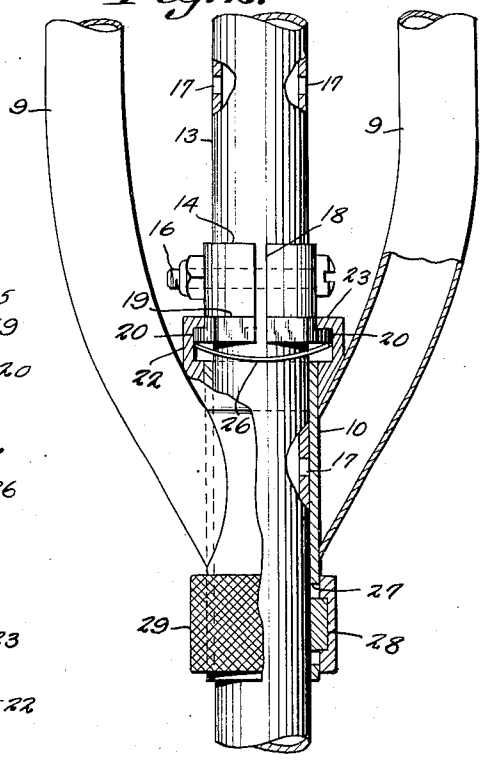
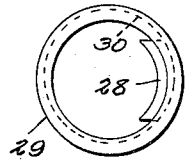


Fig. 6.



Fig. 7.



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CRUTCH

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3 Claims. (Cl. 135—50)

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This invention relates to a telescoping crutch. More particularly, the invention has reference to a telescoping crutch construction wherein a leg member can be adjusted longitudinally of a frame section, a novel means being provided whereby said member and section are locked against movement relative to each other after the adjustment is made.

A telescopic crutch is not in and of itself new, such a crutch being shown in Patent Number 2,426,074, to Joseph C. Watters. The main purpose of the present invention is to provide, in such a crutch, an improved locking arrangement wherein the cooperating lock means on the leg member and frame section respectively can be brought into engagement by the simple expedient of giving a one-quarter turn to the leg member; wherein they can be disengaged with the same ease; and wherein, when said lock means are in engagement, they will cooperate to hold the leg member and frame section both against relative rotatable and relative slidable movement.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts, hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings:

Figure 1 is an elevation of a crutch constructed in accordance with the invention.

Figure 2 is an enlarged fragmentary view, partly in elevation and partly in vertical section, through the lower portion of the crutch, the parts being shown in locked engagement.

Figure 3 is a perspective view of a lock collar carried by the leg member.

Figure 4 is a perspective view of a cambered spring washer positioned in a socket member that is carried by the frame section.

Figure 5 is a perspective view of the socket member.

Figure 6 is a perspective view of a clamping shoe.

Figure 7 is a plan view of a clamping ring, in which the clamping shoe is mounted.

Referring to the drawings in detail, the crutch includes a shoulder rest 8, parallel side frame members 9 rigidly secured at their upper ends to the shoulder rest, and a guide sleeve 10 to which the coverging lower ends of the side frame members are rigidly secured. A hand hold 11 is

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mounted on brackets 12 that can be adjusted longitudinally of the side frame members, and are secured to said members in their selected positions of adjustment by any suitable means, such as bolts or the like.

The parts so far described together constitute the frame section of the crutch.

Slidably mounted in the guide sleeve 10 is the tubular leg member 13 comprising the movable or telescoping section of the crutch. In the position of the parts as illustrated in Fig. 1, the leg member is telescoped into the frame section for its full length.

Mounted on the leg member 13 is a lock collar 14, having aligned openings 15 receiving fastening means 16 preferably comprising a bolt and self-locking nut. Spaced longitudinally of the leg member is a series of openings 17, and thus it can be observed that the lock collar 14 is adapted to be secured to the leg member 13 in selected positions of adjustment longitudinally of the leg member.

The lock collar 14 is preferably split longitudinally as shown at 18, for tighter clamping in adjusted positions to the leg member, and at its lower end is integrally formed with a squared flange or shoulder 19 from two sides of which extend opposed arcuate ribs 20. The upper surfaces of the ribs 20 are disposed in a lower plane than the upper surfaces of the portions of the shoulder 19, as best seen from Fig. 3. The corners of the shoulder 19 are preferably rounded off as at 21, said rounded corners merging into, and conforming to the curvature of, the ribs 20.

Integrally formed with the upper end of the guide sleeve 10 is a cup or socket member 22 through which the leg member 13 extends, and which is of greater diameter than the leg member to provide a space for receiving shoulder 19 and ribs 20 of the lock collar 14. Extended inwardly from the side wall of the cup 22 at the upper or outer end thereof, are diametrically opposed shoulders 23 and these, when viewed in plan, have substantially the same conformation as the arcuate ribs 20. The inner edges of the shoulders 23 are straight and parallel, and are spaced apart a distance substantially equal to the distance between any two opposite sides of the shoulder 19 of the lock collar 14.

An opening 24 is formed in the cup 22, and through this opening is extended the tongue 25 of a cambered spring washer 26, so as to hold the spring washer against rotatable movement in the cup. The raised portions of the spring

washer 26 are disposed below the shoulders 23, as best seen from Fig. 2.

Assuming that the crutch is to be prepared for use by one having need of the same, the lock collar 14 will first be adjusted longitudinally of the leg member 13, so that when the lock collar is engaged in the cup 22, the overall length of the crutch will be adjusted exactly for said person. Ordinarily, as long as the crutch is to be used by that particular person, the lock collar 14 would not be again adjusted along the leg member.

To extend the crutch for use, the leg member 13 is now withdrawn through the guide sleeve 10, and the lock collar 14 entered into the cup 22. In entering the lock collar, the user positions it so that the ribs 20 are disposed between the shoulders 23 of the cup since obviously, the collar could not be entered into the cup if the ribs were positioned otherwise. The lock collar is now drawn into the cup against the action of the spring washer 26, until the upper surface of shoulder 19 clears the undersides of the shoulders 23. Now a one-quarter turn is given to the lock collar by rotating the leg member 13 and when this is done, the lock collar will snap upwardly into the position illustrated in Fig. 2, with ribs 20 engaged under shoulders 23, and the flange 19 engaged between the straight inner side edges of said shoulder. The engagement of ribs 20 under the shoulders holds the leg member and frame section against relative slidable movement while the crutch is in use, and the engagement of flange 19 between the shoulders holds the leg member and frame section against relative rotation. The spring washer 26 retains these locking means in engagement.

It may be noted that during regular use of the crutch, there would be no appreciable tendency of the locking means to become accidentally disengaged. This is due to the fact that a downward pressure is exerted through the side members 9 of the frame, and an upward pressure is exerted through the leg member 13 when the user brings his weight to bear on the shoulder rest 6. The locking means is thus held firmly engaged in the position of Fig. 2.

Preferably, however, to make for completely rigid assembly after the parts are adjusted as described above, I provide an enlarged opening 27 in the guide sleeve 10 near the lower end thereof. An arcuate shoe 28 fits loosely in this opening, and the inner surface of the shoe is adapted to engage the surface of the leg member 13. A knurled clamping ring 27 is fitted upon the guide sleeve 10, rather loosely. The clamping ring 29 is concentric with the guide sleeve and leg member 13, but has formed in its inner surface an eccentric groove 30 receiving the shoe 28.

It will be observed as a result of this construction, rotatable movement of the clamping ring in one direction will wedge the shoe 28 tightly between the ring and the leg member 13, so as to provide a clamp for the leg member. Rotation of the ring in the other direction will break the clamping action of the shoe. The shoe of course, being disposed partly in opening 27 and partly in groove 30, holds the clamping ring mounted to the guide sleeve.

When it is desired to bring the parts to the inoperative position of Fig. 1, the clamping ring 29 is loosened. Then, lock collar 14 is released from collar 22 by pulling downwardly on the leg member, and giving a one-quarter turn thereto

in either direction, as a result of which the collar 14 is freed from cup 22.

A rubber tip 31 is fitted onto the lower end of the leg member 13, for engagement with a supporting surface.

Advantageous characteristics of the construction may now be noted. The user, when he desires to collapse the crutch, does so by the simple expedient of giving a partial turn to the clamping ring 29 and to the leg member 13, after which the crutch is collapsible to half its normal length. When the user again desires to extend the crutch, the same operation is followed, in reverse. When the crutch has been extended, and the parts engaged as in Fig. 2, a completely rigid lock, that cannot be accidentally disengaged or loosened, results.

It may be observed that the clamping ring and shoe not only serve as a supplemental lock when the main lock means is engaged, but also discharges the function of locking the leg member and frame after the leg member is telescoped to the position of Fig. 1.

What is claimed is:

1. A crutch including relative rotatable and slidable frame and leg sections, a lock collar carried by the leg section, a non-circular flange on the collar, opposed ribs extended from the flange, a socket member carried by the frame section, opposed shoulders on the socket member the side edges of which define between them a space of non-circular shape into which said flange fits to engage the flange to hold said sections against relative rotatable movement, said ribs being so located relative to the flange that fitting of the flange into said space causes the shoulders to overlie the ribs to hold the sections against relative slidable movement, and means interposed between the collar and socket member yieldably holding them interengaged comprising a cambered spring washer anchored against rotation in the socket member and having diametrically opposed raised portions respectively underlying said shoulders of the socket member to exert pressure against the ribs when said ribs underlie the shoulders.

2. A crutch including relatively slidable and rotatable leg and frame sections, a lock collar on the leg section, means for adjusting the collar longitudinally of the leg section, a square flange on the collar, a pair of arcuate ribs extended from opposite sides of the flange and disposed in a plane offset from the plane of said square flange, a socket member on the frame section, opposed shoulders having straight side edges extended inwardly from the side wall of the socket member at diametrically opposed points thereof, the side edges of said shoulders defining between them a space into the plane of which the square flange can be fitted to hold the sections against relative rotation, said shoulders adapted to overlie the ribs when the shoulders and flange are coplanar, and a cambered spring washer anchored against rotation in and relative to the socket member and having diametrically opposed raised portions respectively disposed under said shoulders to press said ribs against the undersides of said shoulders.

3. A crutch including a frame section, a socket member rigid with the lower end thereof, a leg member slidably and rotatably mounted in the socket member, a square flange rigid with the leg member, opposed arcuate ribs rigid with and extending laterally from the flange at opposite sides thereof, said ribs being in a plane offset

from the plane of said square flange, the socket member having a flared end, inwardly extended shoulders formed upon the flared end of the socket member, said shoulders having parallel straight side edges defining between them a space the side limits of which are straight and parallel and spaced apart a ditsance sufficient to engage the square flange when said flange is moved into the plane of said space, to hold the frame and leg sections against relative rotatable movement, said shoulders adapted to overlie the ribs when said flange is co-planar with and engaged by the side edges of said shoulders, to hold said sections against relative sliding movement, and yielding means interposed between the ribs and socket member to releasably hold the flange, ribs, and shoulders interengaged, said yielding means comprising a cambered spring washer seated within

the flared end of the socket member and below said shoulders, said washer being anchored within the socket member against rotation relative to the socket member and having diametrically opposite raised portions respectively underlying said shoulders to exert pressure against the ribs when the ribs are disposed below the shoulders.

NELSON R. HENRY.

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