April 10, 1956 C. B. NEPTUNE 2,741,255

ADJUSTABLE HAND REST FOR CRUTCH

Original Filed April 29, 1946

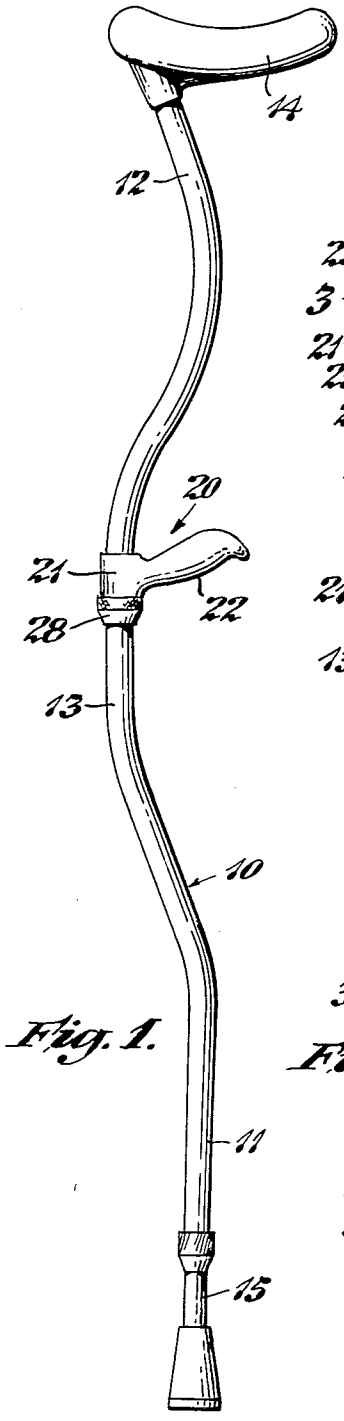


Fig. 1.

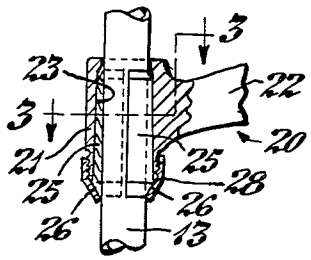


Fig. 2.

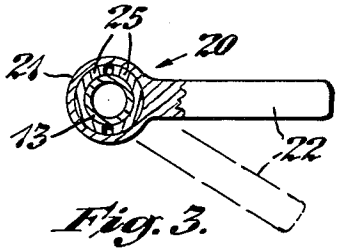


Fig. 3.

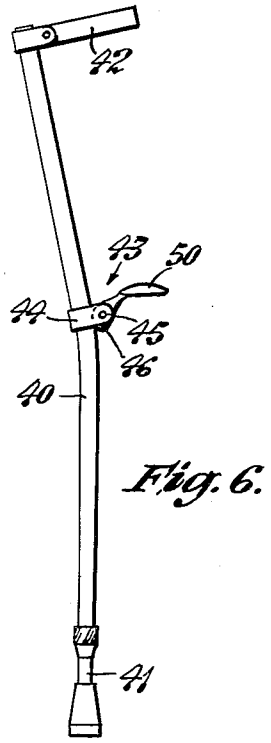


Fig. 6.

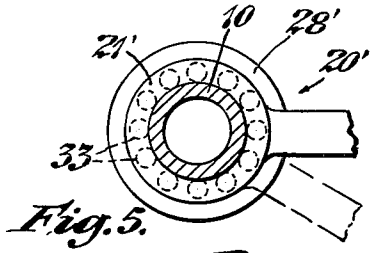


Fig. 5.

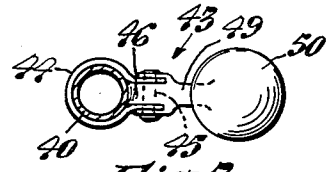


Fig. 7.

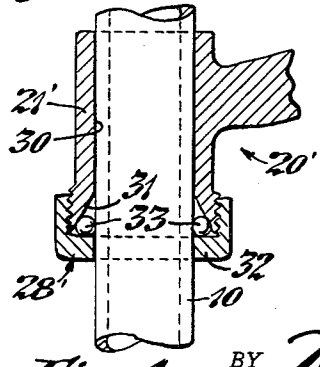


Fig. 4.

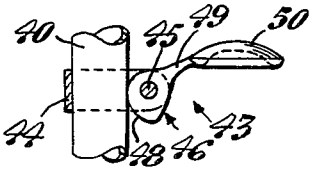


Fig. 8.

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ADJUSTABLE HAND REST FOR CRUTCH

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Original application April 29, 1946, Serial No. 665,863, now Patent No. 2,568,654, dated September 18, 1951. Divided and this application August 23, 1951, Serial No. 243,218

1 Claim. (Cl. 135—51)

This invention relates generally to fastening or connecting means for adjustably securing a cylindrical element to a rod or tube. Specifically, the invention pertains to a hand rest for a tubular metal crutch and means for securing the hand rest in selected positions on the post of the crutch, the present application being a division of my application, Serial No. 665,863, filed April 29, 1946, now Patent No. 2,568,654, issued September 18, 1951, for Crutch.

In order to provide maximum comfort for the user and optimum efficiency in manipulating crutches, it is essential that the hand rests of crutches be located at the correct height so that the wearer can grasp the same while assuming a natural stance. It is also very desirable that the hand rests be inclined with respect to the horizontal and assume a horizontally angular position with respect to the arm rests or arm-encircling bands, to insure that the palms and fingers of the hands will assume a comfortable position while the crippled person is walking. The crutch disclosed in my pending application, referred to above, and in my Design Patent No. D-153,818, issued May 17, 1949, was designed with this objective in view, the crutch being of a particular contour which effects resiliency and thus absorbs shock, the crutch being adjustable in height to suit the users by the use of a vertically adjustable foot portion at the lower end of the tubular crutch post.

As indicated above, the instant application is concerned with an adjustable hand rest for use in connection with my improved tubular metal crutch, and it is therefore a particular object of this invention to provide a hand rest which, when so applied, affords great comfort for the user by enabling the person to hold the crutches in a more natural way without extending or turning his arms or hands to any great extent.

Another object is to provide a hand rest having connecting means incorporated therein by which the hand rest may be secured to the tubular crutch post in any desired position by the simple manipulation of a manually operable actuating means, the connecting means including one or more binding or clamping elements which positively grip the post to retain the hand rest in the selected position.

Another object is to provide a hand rest, of the character referred to, in which downward force applied to the hand rest during use of the crutch increases the binding or gripping action and thus serves to bind the hand rest even more securely in place to prevent accidental release of the hand rest which might result in serious injury to the user. A related object is to provide a connecting means which may be quickly set without the use of tools so that adjustment of the hand rest may be made with facility.

A still further object is to provide a hand rest which is simple in construction, durable in use, and proof against accidental displacement on the crutch post.

Further objects will appear from the following description and from the drawing, which illustrates, by way of example, several embodiments of my invention, and in which:

Fig. 1 is a side elevation of a full-length, tubular, metal crutch embodying one form of my improved hand rest;

Fig. 2 is an enlarged vertical sectional view through the hand rest;

Fig. 3 is a cross-sectional view, taken on line 3—3 of Fig. 2;

Fig. 4 is a vertical sectional view through a hand rest of alternative construction;

Fig. 5 is a plan view of the hand rest of Fig. 4;

Fig. 6 is a side view of a cane-type crutch, showing a further modified hand rest;

Fig. 7 is an enlarged plan view of the hand rest of Fig. 6; and

Fig. 8 is a vertical sectional view of the same.

Referring first to Figs. 1 to 3, the crutch shown therein includes a tubular metal post **10** which has a lower straight portion **11**, a curved and inclined upper portion **12**, and a bowed intermediate portion **13**. An arm piece **14** is carried at the upper extremity of the portion **12**, and the lower portion **11** carries a foot **15** which is adjustable vertically and locked by means disclosed in my pending application referred to previously, so as to vary the length of the crutch in accordance with the height of the person who is to use the same. A crutch of the shape shown in Fig. 1 has considerable vertical "give" or resilience, and thus absorbs the shock which normally is present due to impact of a crutch against the ground or floor at the start of each step.

The hand rest, which is designated generally by the reference numeral **20**, includes a sleeve-like hub portion **21** which surrounds the tubular post at the intermediate bowed portion **13** thereof. Projecting laterally from the hub portion **21** is an inclined arm **22**, which is shaped to be grasped in a hand of the user of the crutch. As shown in Fig. 2, the hub portion has a slightly tapered bore **23** which converges toward the upper end thereof.

A pair of tapered wedges or gripping elements **25**, of substantially semi-circular cross sectional shape, are disposed within the hub portion **21** and have lower ends **26** of increased taper projecting downwardly from the hub portion. The elements **25** may be made from any suitable material having a relatively high coefficient of friction. A sleeve-nut or collar **28** is screwed onto the lower threaded end of the hub portion and has a tapered lower end conforming to the tapered lower ends **26** of the gripping elements **25** and receiving the same.

By this structure, screwing of the collar **28** onto the hub portion **21** forces the wedge elements upwardly into the tapered bore, so that the elements are urged toward each other to grip the tubular post therebetween. Thus, the hand rest **20** is positively secured in place on the post. To adjust the hand rest vertically or rotatively on the post in position to be grasped normally by the hand of the user, the collar **28** is first loosened to release the wedges **25**, after which the hand rest may be readily slid vertically and rotated to any desired position. The sleeve-nut **28** is then retightened to draw the wedges into wedging engagement with the tube or post **10** and thus retain the hand rest in its adjusted position. It will be apparent that during use of the crutch downward force applied against the hand rest will tend to draw the wedges closer together and thus insure even greater binding action and safety by preventing downward sliding movement and rotation of the hand rest on the post of the crutch.

Referring now to Figs. 4 and 5, my invention contemplates a hand rest structure having a clamping or gripping means of the alternative form shown therein. In this embodiment of the invention, the hub portion **21'** of the hand rest **20'** has a straight cylindrical bore **30** to

adapt it to be slidably mounted on the post **10** of the crutch. At the lower end of the hub portion, the bore **30** has a conical portion or countersink **31** which diverges outward toward said end. An annular collar or sleeve-nut **28'** is screwed onto the lower threaded end of the hub portion **21'** and has an end flange **32** upon which rests a plurality of balls **33**. The balls **33** are receivable in the conical portion or seat **31** of the hub, as shown in Fig. 4.

Assuming that the collar **28'** is loosened, the hand rest **20'** is free to be adjusted vertically and rotatively on the post **10**. After the hand rest has been adjusted to the selected position, the collar **28'** is tightened on the hub portion **21'**, and this forces the balls **33** into the conical seat **31**, which then functions to draw the balls radially inwardly into wedging engagement with the periphery of the post **10**. Thus, the hand rest is effectively secured to the post, and downward force applied against the hand rest will cause the balls to grip the post with increased force so that accidental shifting of the hand rest is prevented.

It is also within the concept of this invention to provide a hand rest of the character shown in Figs. 6, 7, and 8. The crutch shown in these views is one of the "cane" or "Canadian" type which is carried by the lower part of the arm, the crutch having a tubular metal post **40** provided with an adjustable foot **41** at its lower end and with an arm-encircling band **42** at its upper end.

A hand rest **43** is provided intermediate the ends of the crutch post **40**, this rest including a band or strap **44** partly encircling the post. Extending between the free ends of the strap **44** is a cross-pin **45**. Pivoted on the pin **45** is a gripping element **46** in the form of a cam having a cam edge **48** arranged eccentric to the pivotal axis. Connected to or formed integrally with the cam **46** is a slotted arm **49** provided at its free end with a hand rest portion **50** which is preferably circular and may be either solid or hollow, as desired, the upper surface being convex. A hand rest of this shape has been found to be more conveniently and comfortably gripped between the palm and fingers of a hand.

To adjust the hand rest **43** vertically and rotatively on the post **40**, the arm **48** is pivoted in counterclockwise direction so as to withdraw the cam **46** from the post, after which the entire hand rest structure may be adjusted to any desired position. Following this adjustment, the arm **49** is pivoted downwardly in clockwise direction to cause the cam edge **48** to wedge against one side of the post **40**. This action causes the band or strap **44** to be drawn tightly against the opposite side of the post to positively secure the structure in place. It is to be noted that since the user of the crutch applies weight against the hand rest arm **49** during walking, the tendency is for

the arm to pivot downwardly, thus even more securely locking the hand rest in its adjusted position to prevent accidental shifting thereof in either vertical or horizontal directions.

It will be apparent that a hand rest of the particular shape illustrated in Figs. 7 and 8 may be used in conjunction with either of the gripping devices of Figs. 2 or 4, and that the rest **22** of Fig. 1 may be employed with the devices of Figs. 4 or 8, within the concept of this invention.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the devices which I now consider to represent the best embodiments thereof, but I desire to have it understood that the devices shown are only illustrative and that the invention may be carried out by further modified means.

I claim as my invention:

In a crutch having a single, upright tubular metal post: a cantilever type hand rest carried by and projecting radially from the axis of the post, said hand rest having a hub surrounding the post and provided with a slightly tapered bore converging toward its upper end, the lower end of the hub being threaded externally; at least two wedge elements of arcuate cross-section disposed within said bore and tapering toward said upper end, the lower ends of said wedge elements projecting below the lower end of said hub and being tapered downwardly; and a screw sleeve screwed onto the threaded end of the hub and having a conical portion engaging the lower, tapered, projecting ends of said wedge elements, said sleeve being operative to force said elements upwardly in said tapered bore so as to cause the elements to slide axially along said tapered bore to be forced radially inwardly thereby so as to wedge between the post and said hub and retain the hand rest in selected positions of vertical and horizontally angular adjustment, engagement of said conical portion with said tapered, projecting ends of said wedge elements causing radially inward gripping action of said ends below said hub.

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