A. B. LOUISON.

CRUTCH.

APPLICATION FILED AUG. 2, 1920.

1,407,553. Patented Feb. 21, 1922.

Fig. 1

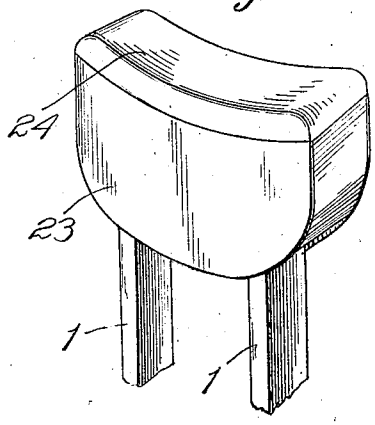
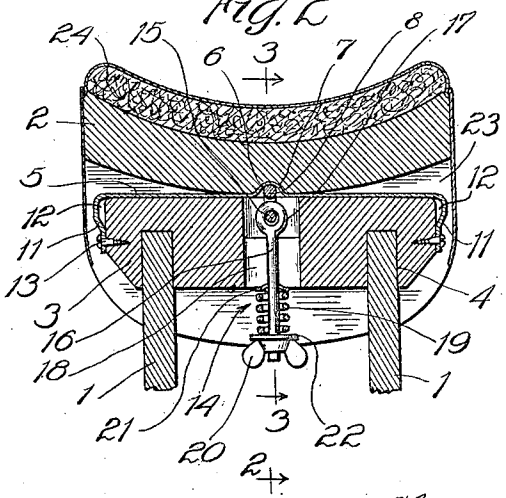


Fig. 2



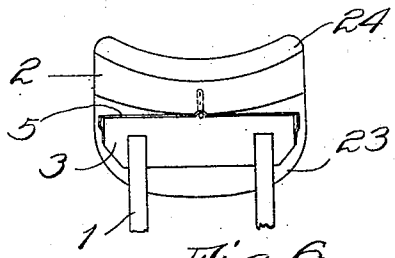


Fig. 6

Fig. 3

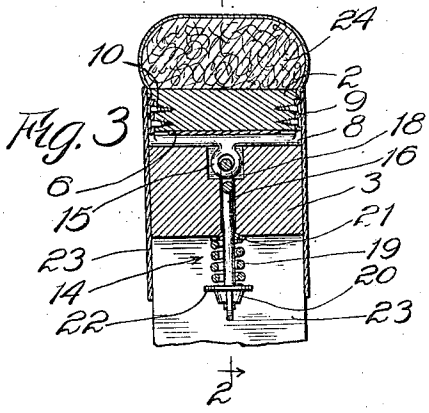


Fig. 7

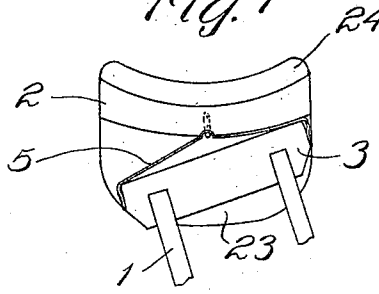


Fig. 4

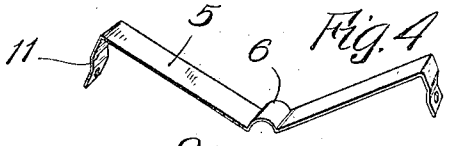


Fig. 5



Inventor
Alfred B. Louison
By Mills Christabel & Baker
Attys

UNITED STATES PATENT OFFICE.

ALFRED B. LOUISON, OF ROCKFORD, ILLINOIS.

CRUTCH.

1,407,553. Specification of Letters Patent. Patented Feb. 21, 1922.

Application filed August 2, 1920. Serial No. 400,628.

To all whom it may concern:

Be it known that I, ALFRED B. LOUISON, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Crutches, of which the following is a specification.

The invention relates to crutches, and it is the object of the invention to provide improved means for mounting the arm rest upon the staff of a crutch whereby the wear upon the clothing of the user it greatly reduced, the discomfort attending its use is minimized, and the effort required in walking with the crutch is materially lessened.

The object of the invention thus generally stated is attained by the construction and arrangement illustrated in the accompanying drawings forming a part hereof, in which Figure 1 is a perspective view of the upper portion of a crutch embodying the features of my invention. Fig. 2 is a sectional elevation taken on the line 2—2 of Fig. 3. Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2. Figs. 4 and 5 are detail views of parts of my construction. Figs. 6 and 7 are diagrammatic views illustrating the action of a crutch embodying my construction in a modified form.

In the embodiment of the invention illustrated, the crutch comprises a staff having crutch-sticks 1, a top piece or arm rest 2, and a bearing member 3 mounted upon the upper end of the crutch-sticks.

The crutch-sticks 1 may be of usual construction and the bearing member 3 is provided in its under side with openings 4 to receive the upper ends of the crutch-sticks.

The top piece 2 is preferably curved on a radius of substantial length so as to enable an easy rolling motion to be effected between it and the bearing member 3 which has a straight upper surface.

By this construction it will be apparent that in the use of the crutch, as the crutch staff is swung to and fro with reference to the top piece, which is held relatively stationary beneath the arm pit of the user, the bearing point between the top piece and the bearing member 3 is constantly shifted according to the angular position of the crutch and in a direction toward the vertical. Thus the weight upon the crutch tends at all times to approach a position in which it can be supported with the least effort on the part of the user.

Between the coacting surfaces of the top piece 2 and the bearing member 3 is provided a flat spring member 5 adapted to hold the top piece in position upon the bearing member without preventing the relative rolling motion therebetween. The center portion of the spring 5 is struck up transversely to form a bend 6 which extends into a recess 7 centrally formed in the top piece 2. A cross bar 8 (see Fig. 5) is positioned within the bend 6 to secure the spring member 5 to the top piece and has upwardly bent flattened end portions 9 which extend along the sides of the top piece 2 and are suitably attached thereto as by screws 10. The spring 5 normally lies flat upon the upper surface of the bearing member 3, extending a substantial distance beyond each end thereof, and having downwardly and inwardly bent ends 11 forming spaces 12 at each end of the bearing member 3. The extremities of the spring 5 are suitably secured to the bearing member 3 as by screws 13. The spring 5 may be formed with its side portions adjacent to the bend 6 extending in upward angular relation to each other (see Fig. 4) so that when assembled in straightened position the tension thereby set up will tend to hold the spring and attached top piece 2 snugly to the bearing member 3.

It will be apparent that as the bearing point of the top piece 2 and the member 3 upon the intervening spring 5 shifts from the center with the swinging of the staff, the center portion of the top piece will rise from the bearing member and carry the spring with it by means of the cross rod 8. The shortening of the distance between its end portions by such action is compensated for by the spaces 12 permitting the end portions to be drawn in. Figures 6 and 7 illustrate the action of the spring member when the crutch is in use. The spring thus secures the top piece against displacement from the bearing member, without interfering with its rolling motion thereon. The spring has the further advantage of tending to return the top piece to its normally central bearing position upon the bearing member.

In the preferred construction of my invention I employ means indicated generally at 14 which cooperates with the spring 5 to secure the top piece to the bearing member and return the two latter members to their normal relation. It is obvious, however, that the means 14 may be omitted. In my

preferred structure, a loop 15 depends from the cross bar 8 to which is flexibly secured a depending rod 16 having an eye 17 engaged with the loop. A vertical slot 18 through the bearing member 3 is formed of suitable width to accommodate the loop 15 and rod 16. A compression spring 19 bearing between the member 3 and wing nut 20 threaded on the lower end of the rod, yieldingly coacts with the flat spring 5 to hold the top piece in position upon the member 3. The upper end of the spring 19 preferably bears upon a slotted washer 21 engaging with the under side of the member 3, and at its other end upon a washer 22 supported by the wing nut 20. It will be seen that the means 14 does not prevent the desired relative motion between the top piece 2 and member 3, but serves to limit the extent of such movement in either direction, the spring being preferably so tensioned as normally to assist in holding the top piece 2 in its central position upon the member 3, without restraining to any material extent the normal rolling movement of these members. The tension of the spring may be adjusted as desired by the user.

For the purpose of preventing the clothing of the user from being caught and bound between the top piece 2 and the member 3, a suitable casing 23 of preferred material is secured about the sides and ends of the top piece 2. The casing extends downward a suitable distance to enclose the member 3 and means 14, and the bottom is open to permit swinging of the crutch staff. If desired, the casing may be made of rigid material so that the sides thereof serve as guide members for the relatively moving parts 2 and 3. A cushion pad 24 may be mounted upon the upper side of the top piece 2, on which rests the user's body.

It will be seen that I have produced a crutch of a very practical character. The top piece or arm rests supports the body of the user in practically constant position without causing the friction and discomfort arising where the top piece swings under the arm with the staff. Wear upon the clothing is materially decreased, and a cushion pad is made possible of use with advantage.

While I have illustrated and described in detail a preferred embodiment of my invention, it should be clearly understood that the disclosure is merely for the purpose of illustration and that many modifications and variations will naturally occur to those skilled in the art, as for instance, that the spring 5 may be of a width somewhat narrower than the parts 2 and 3 and lie in a recess in one or both of them. I aim in the subjoined claims to cover all such legitimate variations and modifications.

I claim as my invention:

1. A crutch having, in combination, a top-piece, a bearing member for the top-piece, said top-piece and bearing member being shaped to permit relative rolling motion therebetween, and a flat spring element between the coacting surfaces of said top-piece and bearing member, said element being attached to said top-piece at its center portion and having its ends yieldingly attached to said bearing member.

2. A crutch having, in combination, a top-piece, a bearing member for the top-piece, said top-piece and bearing member being shaped to permit relative rolling motion therebetween, a flat spring element between the coacting surfaces of said top-piece and varying member, said element being attached to said top-piece at its center portion and having its ends yieldingly attached to said bearing member, and a casing mounted on said top-piece and adapted to enclose substantially the moving parts.

3. A crutch having, in combination, a top-piece, a bearing member for the top-piece, said top-piece and bearing member being shaped to permit relative rolling motion therebetween, a flat spring element between the coacting surfaces of said top-piece and bearing member, said element being attached to said top-piece at its center portion and having its ends yieldingly attached to said bearing member, a rod pivoted at one end to said top-piece and having a nut on its other end, and a compression spring bearing between said nut and said bearing member.

4. A crutch having, in combination, a staff, a bearing member mounted on said staff and having a substantially straight upper surface, a flat spring overlying the upper surface of said bearing member having an upward bend at its center portion and having its ends yieldingly secured to said bearing member, a top-piece having a curved lower surface and having a recess formed centrally thereof to receive the bend in said spring, a cross bar underlying said bend and attached to said top-piece, a central slot through said bearing member, a rod pivoted at one end to said cross bar and depending through said slot, a nut threaded on the other end of said rod, and a spring bearing between said nut and said bearing member.

5. A crutch having, in combination, a staff, a bearing member mounted on said staff and having a substantially straight upper surface, a flat spring overlying the upper surface of said bearing member and having an upward bend at its center, said spring having its ends over-extending said bearing member and bent downwardly and inwardly for attachment thereto thereby forming spaces between said spring ends and the ends of said bearing member adjacent to its up-

per surface, a top piece for said bearing member, and a cross bar underlying said bend and having upwardly extending end portions secured to said top-piece.

6. A crutch having, in combination, a bearing member, an arm-rest member, said members being shaped to permit relative rolling motion therebetween, and a spring element between the coacting surfaces of said members, said element being attached to one of said members at its center portion and having its ends attached to the other of said members.

7. A crutch having, in combination, a bearing member, a movable member, said members being shaped for relative rolling motion therebetween, and a flexible element between and attached to both of said members, said element being adapted to prevent relative longitudinal movement of said members other than a rolling motion therebetween.

8. A crutch having, in combination, a bearing member, a movable member, said members being shaped for relative rolling motion therebetween, a flexible element between and attached to both of said members, said element being adapted to prevent relative longitudinal movement of said members other than a rolling motion therebetween, and means tending to maintain said movable member in an intermediate position.

9. A crutch having, in combinatiton, a bearing member, an arm-rest member, said members being shaped to permit relative rolling motion therebetween, a flat spring element between the coacting surfaces of said members, said element being attached to one of said members at its center portion and having its ends yieldingly attached to the other of said members, a rod pivoted to one of said members, and a coiled spring engaging said rod and the other of said members whereby said members are yieldingly held in relative position.

10. A crutch having, in combination, a bearing member, a movable member, a flexible element between and attached to both of said members, said members being capable of relative rolling movement in contact with said element, and a spring having a pivotal connection with one of said members and bearing upon the other member to yieldingly hold said members in relative position.

11. A crutch having, in combination, a bearing member, a movable member, a flexible element between and attached to both of said members, said members being capable of relative rolling movement in contact with said element, and spring means tending to maintain the movable member in a normal central position.

12. A crutch having, in combination, a pair of relatively rolling members, and a flexible element therebetween adapted to prevent relative movement of said members other than said rolling movement.

13. In a crutch, the combination of a fixed member and a movable member shaped so that the movable member may roll upon the fixed member with the bearing point shifting substantially along the entire length of the fixed member, spring means for retaining said members in operative association, and a flexible element interposed between and secured to both members to hold them against relative longitudinal movement.

In testimony whereof I have hereunto set my hand.

ALFRED B. LOUISON.