No. 679,468. Patented July 30, 1901.

P. W. PRATT.

CRUTCH.

(Application filed Nov. 19, 1900.)

(No Model.)

FIG. 1.

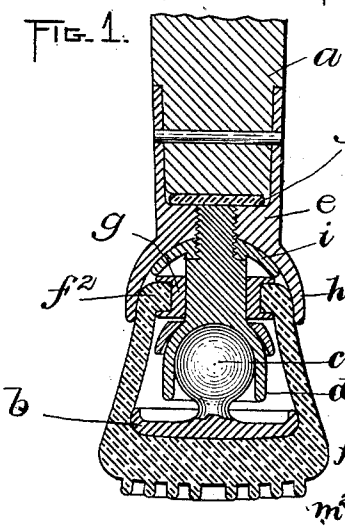

FIG. 6.

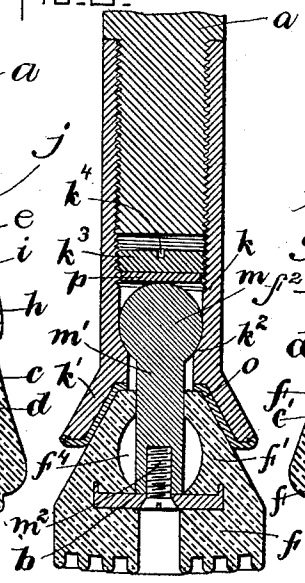

FIG. 2.

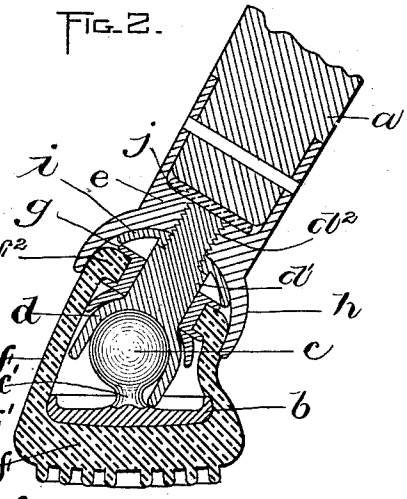

FIG. 3.

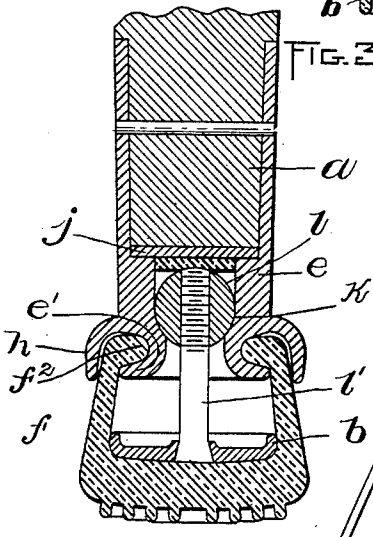

FIG. 5.

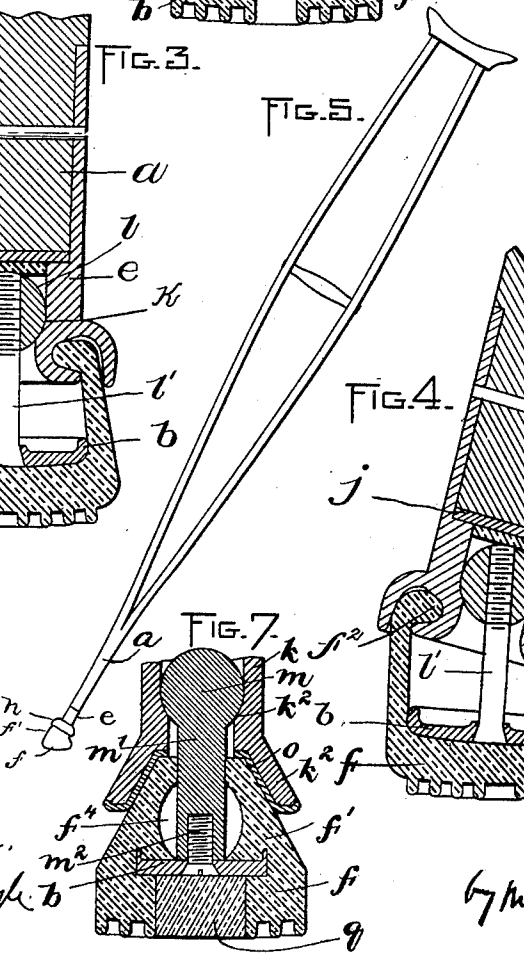

FIG. 4.

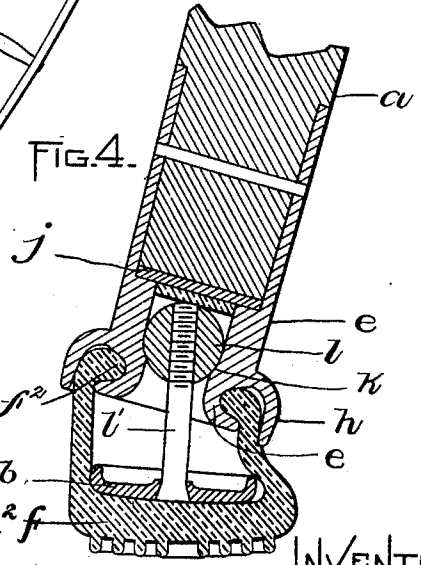

FIG. 7.

WITNESSES:

A. H. Brown.

H. Joseph Doyle.

INVENTOR:

P. W. Pratt

by Wright Brown & Quinby

attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PHILIP W. PRATT, OF BOSTON, MASSACHUSETTS.

CRUTCH.

SPECIFICATION forming part of Letters Patent No. 679,468, dated July 30, 1901.

Application filed November 19, 1900. Serial No. 36,922. (No model.)

To all whom it may concern:

Be it known that I, PHILIP W. PRATT, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Crutches, of which the following is a specification.

This invention has for its object to provide a crutch with an elastic tread for the tip of the crutch adapted to have a tipping movement relatively to the crutch stick or body, so that the tread can stand at any desired angle relatively to the crutch stick or body, and therefore bear squarely upon a pavement or floor without regard to the angle at which the crutch-stick is held.

The invention also has for its object to enable the crutch-stick to have a rotary movement independently of the tread, so that when the user of the crutch gives the stick a partial rotary movement the tread will remain stationary in contact with the pavement or floor.

To these ends the invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figures 1 and 2 represent sectional views showing the lower portion of the crutch-stick and a tip applied thereto embodying my invention. Figs. 3 and 4 represent similar views showing a somewhat-different construction embodying said invention. Fig. 5 represents a side view of a crutch having a tip embodying my invention. Fig. 6 represents a sectional view showing another embodiment of my invention. Fig. 7 represents a modification of the construction shown in Fig. 6.

The same reference characters indicate the same parts in all the figures.

Referring first to Figs. 1 and 2, *a* represents the crutch stick or body, which may be of any suitable construction. *b* represents a foot, which is preferably a disk-shaped piece of metal and has a hinge member engaged with a complemental hinge member connected with the crutch-body in such manner as to permit the foot to have a tipping movement relatively to the crutch-body. The hinge member on the foot is here shown as a ball *c*, connected by a neck *c'* with the foot *b*. The hinge member connected with the crutch-body is here shown as a socket *d*, formed on a stud *d'*, having a screw-threaded extension or shank d^2, engaged with a tapped orifice in a socket or ferrule *e*, which is affixed to the lower end of the crutch-body. The two members *c* and *d* constitute a ball-and-socket hinge, which permits the foot *b* to have a universal tipping movement, so that the foot will stand parallel with the floor or pavement when the crutch-stick is held in an inclined position relatively thereto, as indicated in Figs. 2 and 5. *f* represents an elastic tread which covers the under side of the foot *b* and is preferably ribbed or corrugated on its bottom surface. To maintain the foot *b* and tread *f* in their normal position—that is to say, with the bearing-surface of the foot substantially at right angles to the length of the crutch-stick—I provide the tread with a resilient flange *f'*, which projects upwardly, surrounds the ball-and-socket hinge, and is engaged at its upper end with an annular seat *g*, connected with the crutch-body. As shown in Figs. 1 and 2, the annular seat is a collar which is adapted to rotate loosely on the stud *d'* and has flanges at its upper and lower edges, the flange having a lip f^2, which is elastic and is sprung into the space between said flanges, the inner sides of the flanges and the periphery of the collar constituting the seat. The loose rotation of the collar on the stud *d'* permits the crutch-body to be turned or rotated on its longitudinal axis without a corresponding rotation of the tread and foot. *h* represents a flange formed on the ferrule *e*, said flange projecting downwardly and surrounding the lip f^2 and the grooved member *g*, said flange serving to protect the upper portion of the resilient flange *f'* and prevent the lip f^2 from being sprung out of engagement with the seat *g*. A cup-shaped metal washer *i* is preferably interposed between a shoulder on the stud *d'* and the cup-shaped lower end of the ferrule *e*. An elastic washer *j* is preferably interposed between the bottom of the socket in the ferrule *e* and the lower end of the crutch-stick to prevent rattling of the ferrule.

In the construction shown in Figs. 3 and 4 the socket member is a cavity K, formed in the ferrule *e*, the lower portion of said cavity being somewhat contracted to engage the ball member *l*, which is affixed to a shank *l'*, se-

cured to the foot *b*. The ferrule *e* is provided with a grooved extension *e'*, which constitutes the seat engaged with the lip f^2 on the resilient flange of the tread *f*. In this embodiment of my invention the ferrule has a retaining-flange *h* surrounding the lip f^2 and the seat which engages said lip.

It will be seen that the above-described improvement enables the tread to bear squarely against the floor or pavement when the crutch is inclined, as shown in Fig. 5, as well as when it is held vertical, as shown in Fig. 1.

It will be seen that the resilient flange, which is integral with the tread, (both being made of elastic rubber or other like resilient material,) not only returns the tread and foot to their normal position after displacement, but also holds the tread in position on the foot and prevents access of dirt to the hinge.

In Fig. 6 I show the construction which in certain respects is preferred by me to either of those previously described. In said Fig. 6, *k* represents the ferrule, which is secured to the lower end of the crutch stick or body *a* and has at its lower end a frusto-conical flange *k'*, the inner surface of which constitutes the seat for the resilient flange *f'* of the elastic tread *f*. The flange *f'* in this case is of frusto-conical form externally, its tapering upper end fitting in the tapering flange *k'*. The ferrule *k* is provided near its lower end with an internal shoulder k^2. Above said shoulder and engaged with an internal screw-thread formed in the ferrule is an abutment k^3, which is externally threaded and provided with a slot k^4, whereby it may be rotated by a screw-driver inserted in the ferrule. The abutment k^3 and shoulder k^2 constitute a socket which confines and permits the partial rotation in any direction of a ball *m*. From the ball *m* projects downwardly a stud or shank *m'*, to the lower end of which the foot *b* is secured by a screw m^2. The upper portion of the flange *f'* is in contact with the stud *m'* and is held thereby in engagement with the seat on the lower end of the ferrule. It will be seen that the ball *m* and the socket in which it is inclosed constitute a hinge connection between the foot and the ferrule *k* and that the resilient flange *f'* of the tread *f* coöperates with the seat on the lower end of the ferrule in returning the foot to its normal position after displacement and in excluding dust, &c., from the hinge. The flange *f'* is preferably recessed internally to form a cavity f^4, surrounding the shank *m'*, this cavity increasing the compressibility of the flange *f'* and enabling it to yield more readily to permit the tipping of the foot than would be the case if the recess f^4 were not provided. I prefer to interpose a conical washer *o* between the flange *k'* on the ferrule and the elastic flange *f'* on the tread, said washer being loose and adapted to slip upon the flange *k'*. The washer *o* constitutes the acting portion of the seat for the flange *f'* and enables said flange with the tread *f*, foot *b*, stud *m'*, and ball *m* to stand stationary while the crutch-stick and the ferrule *k* are being partially rotated, the washer *o* serving in this respect the same purpose as the collar *g* shown in Figs. 1 and 2. *p* represents a loose disk interposed between the abutment k^3 and the ball *m*.

In Fig. 7 I show a plug *q*, of cork, inserted in a cavity formed for its reception in the elastic tread *f*, the lower end of said tread forming a part of the tread-surface and decreasing the liability of the tread-surface to slip upon wet surfaces.

I do not limit myself to the details of construction here described, as the same may be variously modified without departing from the spirit of my invention. The hinge may be of any desired form and adapted to give the foot a tipping movement on a single axis instead of a universal tipping movement.

I claim—

1. A crutch comprising a body portion having a rigid annular seat at its lower end portion, a foot below said seat, hinge members connected respectively with the foot and with the body, and permitting a tipping motion of the foot, and an elastic tread bearing on the foot and movable therewith, said tread having an upwardly-projecting resilient flange or sleeve surrounding the foot and engaged at its upper end with said annular seat, whereby the tread and foot are yieldingly maintained in their normal position, the flange also serving to exclude dust, &c., from the hinge members.

2. A crutch comprising a body portion having a rigid annular seat at its lower portion, a foot below said seat, hinge members connected respectively with the foot and with the body, and permitting a tipping motion of the foot, and an elastic tread bearing on the foot and movable therewith, said tread having an upwardly-projecting resilient flange or sleeve surrounding the foot and engaged at its upper end with said annular seat, whereby the tread and foot are yieldingly maintained in their normal position, the said seat being loose so that the body can be rotated independently of the foot.

3. A crutch comprising a body portion having a conical seat at its lower end and a socket hinge member above said seat, a stud having a ball hinge member engaged with said socket member, the stud projecting downwardly through the conical seat, a foot affixed to the lower end of the stud and an elastic tread affixed to the foot and having an upwardly-projecting resilient flange or sleeve having a conical upper portion which bears upon the conical seat.

4. A crutch comprising a body portion having a conical seat at its lower end and a socket hinge member above said seat, a stud having a ball hinge member engaged with said socket member, the stud projecting downwardly through the conical seat, a foot affixed to the lower end of the stud and an elastic tread affixed to the foot and having an upwardly-

projecting resilient flange or sleeve having a conical upper portion which bears upon the conical seat, the seat being loose so that the body portion can be rotated independently of the foot-tread and flange.

5. A crutch-tip comprising a ferrule adapted to receive a crutch stick or body, and provided internally with a shoulder near its lower end, and with an abutment above said shoulder, the shoulder and abutment constituting a socket member, a ball member contained in said socket and having a stem projecting below the ferrule, a foot secured to the lower end of said stem, and an elastic tread secured to the foot and having an upwardly-projecting resilient flange or sleeve which is seated on the lower portion of the ferrule.

In testimony whereof I have affixed my signature in presence of two witnesses.

PHILIP W. PRATT.

Witnesses:
C. F. BROWN,
E. BATCHELDER.