June 2, 1925. 1,539,911

W. A. PENDERGRAFT

LEG SPLINT

Filed Oct. 4, 1922 2 Sheets-Sheet 1

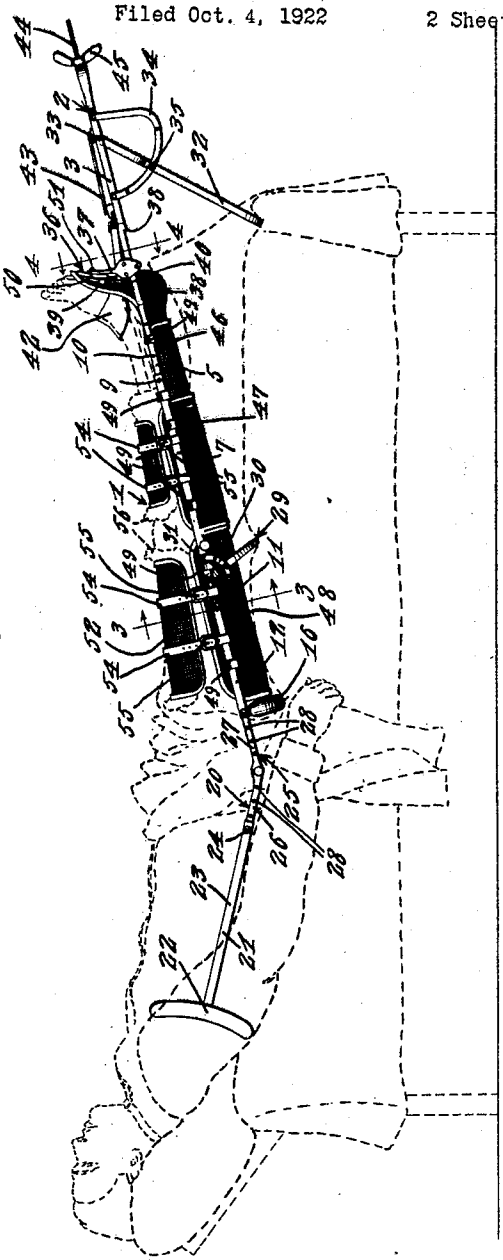


Fig. 1.

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2 Sheets-Sheet 2

Fig. 2.

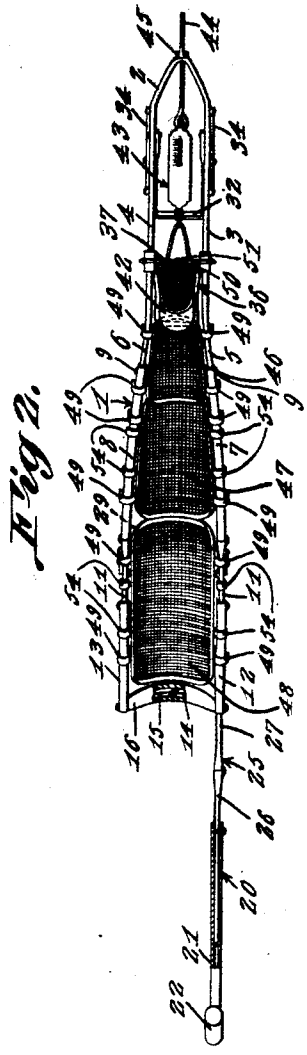


Fig. 4.

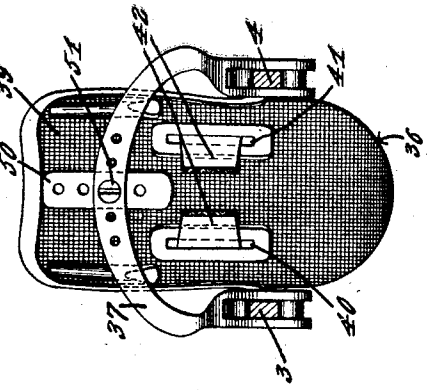
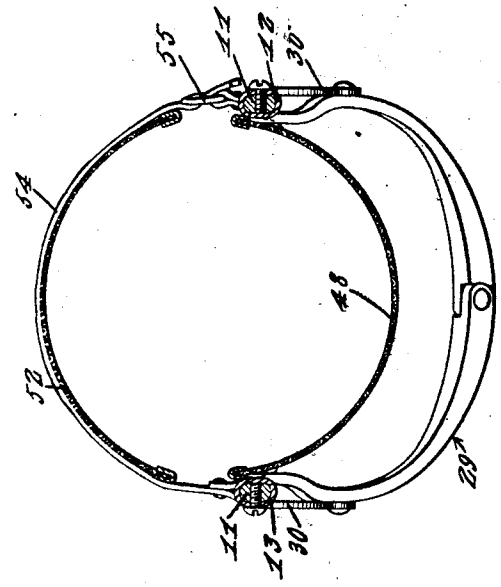


Fig. 3.



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Patented June 2, 1925. 1,539,911

UNITED STATES PATENT OFFICE.

WILLIAM A. PENDERGRAFT, OF CARNEY, OKLAHOMA.

LEG SPLINT.

Application filed October 4, 1922. Serial No. 592,309.

To all whom it may concern:

Be it known that I, WILLIAM A. PENDERGRAFT, a citizen of the United States, residing at Carney, in the county of Lincoln and State of Oklahoma, have invented new and useful Leg Splints, of which the following is a specification.

This invention relates to surgical apparatus and more particularly to splints for broken or otherwise injured legs.

The object of the invention is to provide a splint of this character constructed so as to maintain a broken leg or one having tubercular joints in a comfortable normal position and to provide uniform traction in order that best results may be obtained.

Another object is to so construct an apparatus that it may fit legs of different lengths and sizes and which is equipped with removable means to support the leg at various inclinations.

Another object is to provide a simple and efficient means for stretching the injured leg with the least discomfort possible by means of which any desired traction and permanent extension may be made.

Another object is to provide a splint of this character having a crutch-like arm engaging extension connected therewith at the hip to assist in the stretching operation and to permit the patient to bear down on from the shoulder to relieve pressure against the body.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 represents a side elevation of a splint constituting this invention shown applied.

Fig. 2 is a plan view thereof detached with parts in section.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1, and

Fig. 4 is a similar view taken on the line 4—4 of Fig. 1.

In the embodiment illustrated, the splint 1 constituting this invention comprises a substantially elongated U-shaped member 2, the side rails 3 and 4 of which are designed to lie alongside the opposite sides of the user's leg as is shown in Fig. 1. These side rails 3 and 4 extend parallel for the major portion of their length and at their outer rear ends diverge as shown at 5 and 6 to conform to the shape of the leg. These diverging ends 5 and 6 telescopically engage hollow side rails 7 and 8 and are adjustably secured therein by means of set screws 9, which pass through openings in the side rails 7 and 8 at their front ends and enter apertures 10 in the rails 5 and 6 a plurality of which are provided and spaced longitudinally so that the length of the rails may be varied to adapt the apparatus to fit legs of different lengths. The hollow side rails 7 and 8 have hingedly connected extensions 11 which telescopically engage hollow bars 12 and 13 connected at their outer ends by curved hingedly connected sections 14 and 15 which provide for the rails 12 and 13 being adjusted toward or away from each other to fit legs of different sizes. These hingedly connected sections 14 and 15 form, when united, a substantially semi-circular thigh support as is shown clearly in Fig. 1 and are preferably padded as shown at 16 to prevent abrasion of the user's leg. The hinge connection of the rails 7 and 8 with the extensions 11 provides a hinge joint at the knee portion of the splint to permit bending or passive motion of the knee to prevent ankylosis of the knee joint, which frequently occurs when the knee joint is severely injured.

The rails 12 and 13 are hollow throughout and open at both ends, their outer or rear ends being designed to receive a crutch-like member 20. One of these members only is provided, it being designed to be connected with the outside rail of the splint according to which leg the splint is used on.

This clutch-like member 20 is composed of a T-shaped outer section 21, the head 22 of which is longitudinally curved to adapt it to fit under the arm of the user while its shank or stem 23 is made hollow, carrying at its outer end a set screw 24 which is designed to adjustably engage an extension member 25. This extension member 25 is composed of bars 26 and 27 hingedly connected at their inner ends to form a hinge joint at the thigh joint of the patient to permit bending at this point. Each bar 27 is provided with a plurality of longitudinally

spaced apertures 28 for adjustably connecting the bar with the rail 12 at one end and with the shank 23 at the other end.

A leg support 29 is connected with the members 11 of the side rails and is here shown in the form of a stirrup composed of hingedly connected sections to provide for the positioning of the rails toward and away from each other to fit legs of varying sizes. This stirrup 29 is pivotally connected at its ends with the members 11 adjacent their hinged connection with the members 7 and 8, said stirrup ends being offset inwardly and located on the inner faces of the rails or members 11 as is shown clearly in Fig. 3. Arcuate brackets 30 are fixedly connected at one end to the inner ends of the members 11 between the pivotal connection of the stirrup therewith and their hinged connection with members 7 and 8.

These arcuate brackets have a plurality of longitudinally spaced apertures to receive set screws as 31, which are designed to detachably connect the stirrup 29 with the brackets so that it may be positioned at a greater or less inclination according to the position in which the leg is to be used. A rest or support 32 connected with the foot portion or front end of the splint is here shown U-shaped in form with the legs thereof offset inwardly at their outer ends and pivotally connected at 33 with the side rails 3 and 4. Depending brackets 34 are carried by the side rails 3 and 4 and are apertured for adjustable connection with the side bars of the support 32, being held engaged therewith by set screws as 35 to adapt the foot portion of the splint to be raised or lowered to suit the comfort of the user or the will of the surgeon.

A foot support 36 is preferably constructed of woven wire is mounted between the side rails 3 and 4, being carried by an upstanding inverted U-shaped sliding hanger 37.

The free ends of this hanger are bifurcated, as shown in Fig. 4 and the furcations thereof straddle the side bars or rails 3 and 4 and are equipped with ball or roller bearings to permit them to slide freely on the rails and are limited in their sliding movement by depending shoulders 38 on the lower faces of the side rails.

This foot support 36 is shaped to conform to the user's foot as is shown clearly in Fig. 1, and the sole portion 39 thereof is equipped with transversely spaced longitudinally extending slots 40 and 41, through which an attaching strip 42 is designed to pass connecting the foot support with the foot of the user and with a scale 43 as is shown clearly in Fig. 2. This scale 43 is connected at its other end with a threaded rod 44 adjustably mounted in the outer end of the member 2 and secured in adjusted position by a wing nut 45. This scale 43 being connected with the strap 42 is designed for stretching the leg of the user and the required traction is placed thereon by turning the wing nut 45 to project or retract the rod 44.

Wire cloth splints 46, 47, and 48 of desired length and depth are designed to be suspended on the rails at the opposite sides of the apparatus by means of hooks 49 which are soldered or otherwise secured to the splints to form a rest for the leg to be supported. The foot rest 36 referred to above, is also constructed of wire cloth and is adjustably connected to the hanger member 37 by means of a longitudinally extending apertured plate 50 through which and the member 37 passes a set screw 51 to provide for the lateral adjustment of the foot rest relatively to the rails.

Cooperating wire cloth splints 52 and 53 are arranged over the leg opposite the splints 47 and 48, and are held in operative position by means of straps 53 which are preferably made in sections, one being carried by one side rail and the other being carried by the other and united by buckles as 55.

Absorbing cotton or other suitable packing is shown at 56 arranged between the leg of the user and the top splint sections 52 and 53 to prevent them from abrading the wearer's leg.

From the above description it will be obvious that the splint constituting this invention may be used on either the left or the right leg by simply transferring the clutch-member 20 from one rail to the other, Figs. 1 and 2 showing it applied for use on the right leg.

If desired, the supporting stirrups 29 and 32 may be folded down flat or removed as may also the bracket members with which they are connected so as to permit the leg to lie out straight. Should the heel of the patient or the ankle be seriously injured, the foot rest 36 may be removed and proper bandages substituted.

I claim:—

1. A leg splint comprising laterally spaced side rails to be mounted along the sides of the leg to be supported, a U-shaped bar connecting the front ends of said rails, a crutch member carried by one of said rails and hingedly connected at the hip, said side rails having a hinge therein at the knee portion to permit passive motion of the knee to prevent ankylosis of the knee joint, a stirrup connecting said side rails and composed of hingedly connected sections to provide for the positioning of the rails toward or away from each other to fit legs of varying sizes.

2. A leg splint comprising laterally spaced side rails to be mounted along the sides of

the leg to be supported, a U-shaped bar connecting the front ends of said rails, a crutch member carried by one of said rails and hingedly connected at the hip, said side rails having a hinge therein at the knee portion to permit passive motion of the knee to prevent ankylosis of the knee joint, a stirrup connecting said side rails and composed of hingedly connected sections, said stirrup being pivotally connected at its ends with the said rails adjacent the hinge in said rails, and arcuate brackets fixedly connected at one end to the inner ends of the hinged rail members between the pivotal connection of the stirrup therewith, the other ends of said brackets being detachably and adjustably connected with said stirrup so that it may be positioned at a greater or less incline according to the position in which the leg is to be supported.

3. A leg splint comprising laterally spaced side rails to be mounted along the sides of the leg to be supported, a U-shaped bar connecting the front ends of said rails, a crutch member carried by one of said rails and hingedly connected at the hip, said side rails having a hinge therein at the knee portion to permit passive motion of the knee to prevent ankylosis of the knee joint, a stirrup connecting said side rails and composed of hingedly connected sections, said stirrup being pivotally connected at its ends with the said rails adjacent the hinge in said rails, and arcuate brackets fixedly connected at one end to the inner ends of the hinged rail members between the pivotal connection of the stirrup therewith, the other ends of said brackets being detachably and adjustably connected with said stirrup so that it may be positioned at a greater or less incline according to the position in which the leg is to be supported, a U-shaped rest pivotally connected with the foot portion of said splint, brackets carried by the said rails and adjustably connected with the rest to adapt the foot portion of the splint to be raised or lowered to suit the comfort of the user.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM A. PENDERGRAFT.

Witnesses:
R. E. HANMER,
HUGH DEAN.