Nov. 24, 1925. **1,562,935**

A. H. WHISNER

SURGICAL BRACE

Filed April 18, 1923

Fig. 1

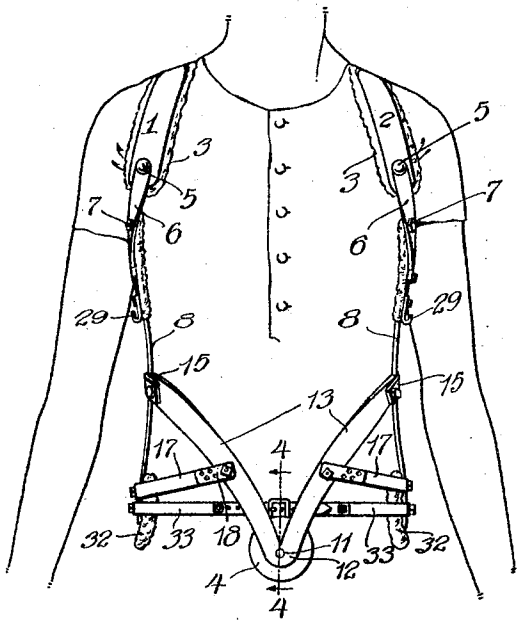


Fig. 2

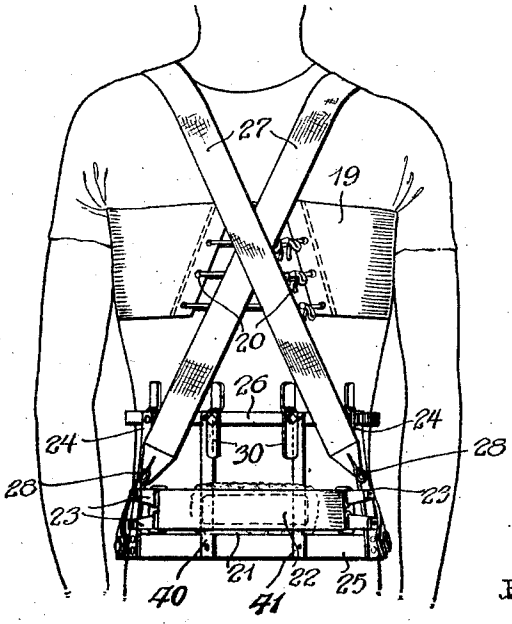


Fig. 3

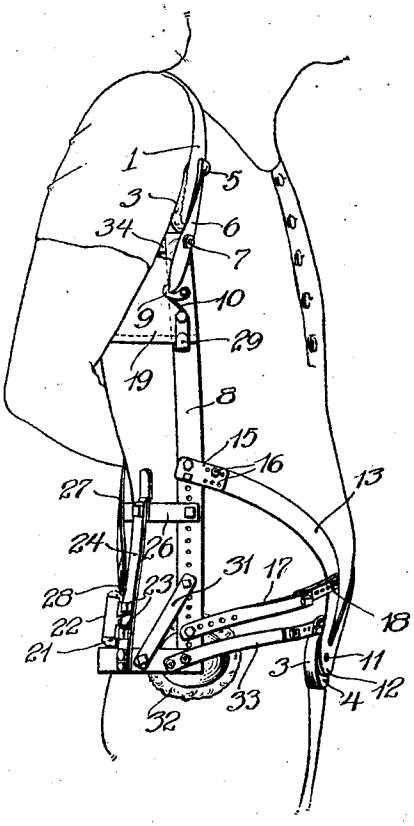
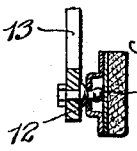


Fig. 4



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UNITED STATES PATENT OFFICE.

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SURGICAL BRACE.

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To all whom it may concern:

Be it known that I, ALLEN H. WHISNER, a citizen of the United States, residing at Greensboro, in the county of Guilford and State of North Carolina, have invented certain new and useful Improvements in Surgical Braces, of which the following is a specification.

This invention relates to certain new and useful improvements in surgical braces or spinal supports, and it has for its objects among others to provide an efficient device of this character adapted to the following purposes and uses, and having the hereinafter named advantages.

Purposes.

Pathologically.—In certain pathological conditions, to secure relief from mechanical pinch upon spinal nerve roots caused by motion of the spine upon itself, as in bending or twisting, or by jar or pressure, as in walking or lifting.

Mechanically.—First, to immobilize, or stiffen, the spine, that is, to prevent, as far as possible, all motion of the spine upon itself, such as stooping, or bending in any direction, or twisting movements of any kind.

Second, to secure from the point of attachment at the hips some vertical support for the upper part of the trunk.

Uses.

In arthritic spine where there is narrowing of the spinal foramina due to bacterial activity in the spinal tissues.

In tubercular spine.

In spinal curvatures.

In all abnormal spinal conditions where there is muscular strain and a consequent sense of physical weakness in those parts.

Advantages.

The device is inconspicuous since it conforms closely to the body lines.

It is safe and fairly comfortable since the basis of support is the bony structure and no vital part is subjected to injurious pressure.

There are no rigid steels up and down the back.

All points of support are well padded with thick wool felt.

The shoulder pads are made to release for more freedom of arm and shoulder movement when the patient wishes to lie down, or upon other occasions.

The device is made adjustable, so that it can be readily fitted to different patients.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out in the appended claims.

The invention is clearly illustrated in the accompanying drawing, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a front view showing the brace or support as in use.

Figure 2 is a rear view.

Figure 3 is a side view.

Figure 4 is a section on the line 4—4 of Figure 1.

Like numerals of reference indicate like parts throughout the different views.

Application of the device—for posterior support.

Anterior fulcra.—The device provides three fulcra on the anterior surface of the body, one in front of each shoulder, and one upon the pubic bone. At these points steel pads 1—2—4 are fitted to the body, the pads 1 and 2 in front of the shoulders being padded with wool felt or the like, as seen at 3 in Figure 1; the pubic pad 4 may or may not be provided with a fabric or other padding, as may be desired.

The shoulder pads are connected by ball and socket joints 5 with short twisted, preferably steel, straps 6, each of which articulates at substantially its midlength upon a pivot 7 upon the top of each upright side steel 8, while its lower end is retained in position by a hook or analogous member 9 held in engagement with the end of the steel 6 by a spring 10, see Figure 3, except when greater freedom of arm and shoulder is required.

The pubic pad 4 may, if desired, be made detachable, in which case its center post 11 may be inserted through an opening in the lower end, or apex, 12, of the double curved abdominal steel 13, or it may be there attached by a ball and socket joint, as indicated at 14 in Figure 4. The upper ends of the side members of this double curved abdominal steel are attached to the upright side steels 8 above the crest of the ilium by suitable means, as, for instance, two short lugs or the like 15, having provision for ad-

justment, as seen at 16 in Figure 3. Near the bottom of the upright side steels are attached straps 17 of leather or other suitable material, the other end being provided with suitable means of adjustment and connected with the abdominal steel 13 at a point about two-thirds of the length downward of the latter, as seen at 18, such adjustment being provided to regulate the downward and backward pressure upon the pubic bone. One side of the abdominal steel 13 is made readily detachable for putting on and off. This arrangement and combination gives a rigid anterior base for leverage for posterior support.

For posterior leverages.—Posterior support is secured by the device at two points:— In the dorsal section support is secured by means of a broad band or corset-like member 19, see Figure 2, which is attached at its ends to the side steels 8 and arranged under the arm pits and provided at the back with suitable lacing 20 for adjustment as occasion may require. This grips the dorsal spine forward into proper position, and assists also in securing it laterally.

In the lumbo-sacral support is secured by means of the sacral pad 21 of suitable material carried by the member 22 having at each end adjustable lugs or the like 23 which are attached to small upright steels 24, the lower ends of which are attached to the steel hip band 25, the upper ends to a smaller metallic waist band 26, the ends of which waist band are connected to said side steels 8. The hip and waist bands 25 and 26 do not touch the body. Two straps preferably of canvas hold the pad in accurate position just back of the prominent upper edge of the sacrum. These straps 41 and 40 are stretched tight just back of each end of the pelvic pad, pass vertically over the steel bands 25 and 26, and are attached to the pad and secured to the bands in such a way that the pad cannot move up or down. By means of these straps this pad may be raised or lowered as desired. In this position, somewhat above the level of the pubic bone, the sacral pad pulls firmly forward on the top of the pelvis, while the pubic pad thrusts downward and backward upon the bottom, thus effecting proper correction of the backward sag of the lumbo-sacral section of the spine.

27 are elastic straps attached at their upper ends to the shoulder pads 1 and 2, as seen in Figures 1 and 2, which are crossed over the shoulders, and passed diagonally down the back to hooks or any suitable fastenings 28 on the short upright steels 24 at the ends of the sacral pad, thus holding the shoulder pads in proper position.

On each side steel 8 just below the hook 9 is a hook 29 for the support of drawers and trousers, the trousers suspender passing through button holes in the shirt. Short members or spurs 30 attached at intervals to the waist band 26, as seen in Figure 2, serve to receive the pressure from the trousers band and belt.

31 are angle braces at the junction of the hip band 25 and the upright side steels 8, and adjustably connected with the latter, as seen in Figure 3, to fix the hip band at the proper elevation and to stiffen the device at these points.

For vertical support.—The device is built upon the great trochanters of the femurs, or thigh bones, steel backed pads 32, preferably provided with ball and socket joints, being secured firmly in place by means of straps 33 buckling in front and the steel band 25 reaching around the hips, ball and socket joints attaching these pads to the lower ends of the upright side steels 8. At the top of these side steels a short curved steel 34 reaches back under the arms, receiving much of the weight of the upper part of the trunk. A slight lift is also secured by the downward thrust upon the pubic bone. Considerably more may be secured, if desired, by tightening the lower laces of the band 19.

Almost complete lateral stiffening is secured by means of the close fitting side steels in connection with their attachments—the adjustable lugs attaching to the abdominal steel, the under arm steels, and the firmly seated hip pads.

The angle braces, the waist band and the hip band, and the firm grip upon pelvic and dorsal sections, in connection with the stout quality of the upright side steels, make it difficult to execute a twist movement in such a brace.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What is claimed as new is:—

1. In a surgical brace, means for affording three fulcra on the anterior surface of the body, one in front of each shoulder and one upon the pubic bone, means for gripping the dorsal section and for gripping the dorsal spine.

2. In a surgical brace, means for affording three fulcra on the anterior surface of the body, one in front of each shoulder and one upon the pubic bone, means for gripping the dorsal section and for gripping the dorsal spine forward into proper position and assisting in securing it laterally.

3. In a surgical brace, means for affording three fulcra on the anterior surface of the body, one in front of each shoulder and one upon the pubic bone, means for gripping the dorsal section and for gripping the dorsal spine, and means for support in the lumbo-sacral section.

4. In a surgical brace, means for affording three fulcra on the anterior surface of the body, one in front of each shoulder and one upon the pubic bone, means for gripping the dorsal section and for gripping the dorsal spine forward into proper position and assisting in securing it laterally, and a sacral pad for affording support in the lumbo-sacral section.

5. In a surgical brace, front shoulder and pubic pads, giving a rigid anterior base for leverage for posterior support, a sacral pad for gripping the dorsal spine forward, a laced corset member in the dorsal section, a hip band out of contact with the body of the wearer, an inelastic support therefor and a waist band also out of contact with the body of the wearer.

6. In a surgical brace, means for affording three fulcra on the anterior surface of the body, one in front of each shoulder and one upon the pubic bone, means for gripping the dorsal section and for gripping the dorsal spine forward into proper position and assisting in securing it laterally, a sacral pad for affording support in the lumbo-sacral section, and means adapted to reach back under the arm to aid in sustaining the weight of the upper part of the trunk.

7. In a surgical brace, means including pads for affording three fulcra on the anterior surface of the body, one in front of each shoulder and one upon the pubic bone, means for gripping the dorsal section and for gripping the dorsal spine forward into proper position and assisting in securing it laterally, a sacral pad for affording support in the lumbo-sacral section, and firmly seated hip pads and inelastic support therefor.

8. In a surgical brace, front shoulder and pubic pads, giving a rigid anterior base for leverage for posterior support, a sacral pad, a laced corset member in the dorsal section for gripping the dorsal spine forward, a hip band out of contact with the body of the wearer, a waist band also out of contact with the body of the wearer, and means on the waist band to receive the pressure from the trousers and belt.

9. In a surgical brace, side steels, shoulder pads, twisted metallic straps joining said pads and steels, a double curved abdominal steel having its ends supported by said side steels, and a pubic pad carried by said abdominal steel at the centre of the curved portion thereof.

10. In a surgical brace, side steels, shoulder pads, twisted metallic straps joining said pads and steels, a double curved abdominal steel having its ends supported by said side steels, a pubic pad carried by said abdominal steel at the centre of the curved portion thereof, hip and waist bands connected to said steels, a sacral pad between the hip and waist bands, and angle braces at the junctions of the hip band and side steels to stiffen the device at said points.

In testimony whereof I affix my signature.

ALLEN HAMMOND WHISNER.