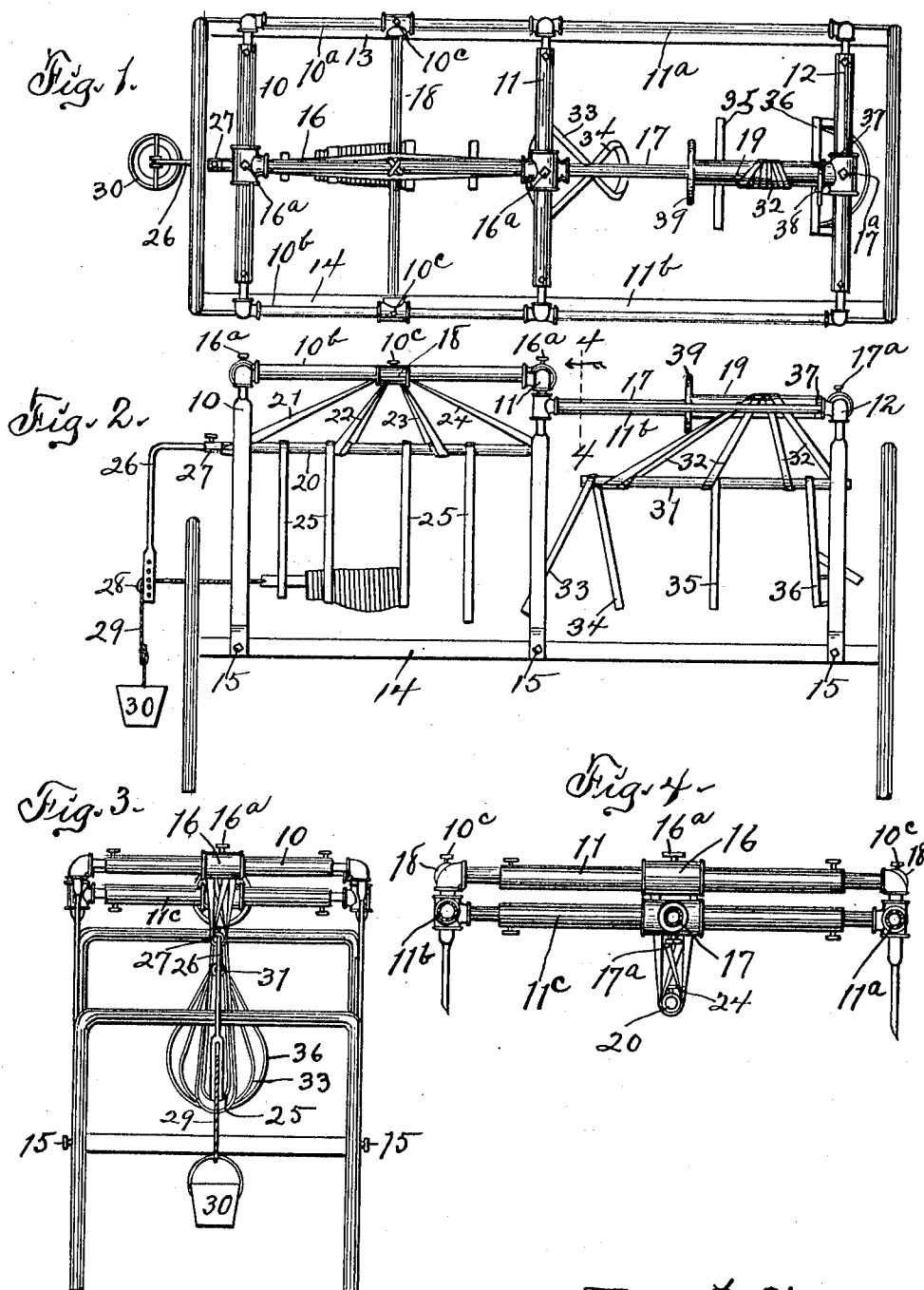


N. E. MIGHELL.
SURGICAL APPLIANCE.
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Patented Oct. 15, 1912.



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UNITED STATES PATENT OFFICE.

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SURGICAL APPLIANCE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NORMAN E. MIGHELL, a citizen of the United States of America, and resident of Marshalltown, Marshall county, Iowa, have invented a new and useful Surgical Appliance, of which the following is a specification.

The object of this invention is to provide improved means adapted for conjunctively sustaining and applying extension to a fractured human leg, particularly in respect of fractures of the femur.

A further object of this invention is to provide means for permitting rotary adjustment of a fractured human leg while said leg is sustained and extended.

A further object of this invention is to provide means for adjusting the altitude of a fractured human leg while said leg is sustained and extended.

A further object of this invention is to provide means for permitting a patient having a fractured leg to assume various positions with the trunk, arms, head and uninjured leg without disturbing or jeopardizing the fractured leg.

A further object of this invention is to provide means for sustaining, raising, lowering and adjusting the trunk, buttocks and head of a patient having a fractured leg, either conjunctively with or independently of the uninjured leg.

My invention consists in the construction, arrangement and combination of elements hereinafter set forth, pointed out in my claims and illustrated by the accompanying drawing, in which—

Figure 1 is a plan of the complete apparatus mounted as required for practical use. Fig. 2 is a side elevation of the same. Fig. 3 is an end elevation of the same. Fig. 4 is a cross-section, on enlarged scale, on the indicated line 4—4 of Fig. 2.

In the construction of the apparatus as shown the numerals 10, 11, 12 designate arches, in this instance three in number and approximately alike in construction. The feet of the arches 10, 11, 12 preferably are forked and adapted to embrace side rails 13, 14 of a bedstead between the head and foot thereof, and are provided with set screws 15 adapted to secure said feet to said rails. The arches 10, 11, 12 preferably are formed with telescoping cross members adapted to be connected rigidly by set screws whereby the width of the arches may

be adjusted to fit bedsteads of varying widths. The arches 10, 11 preferably are connected rigidly at their angles by longitudinal side bars 10^a, 10^b and the arches 11, 12 preferably are connected rigidly by similar longitudinal side bars 11^a, 11^b. The arch 12 preferably is of slightly less height than the arches 10, 11 and the end portions of the bars 11^a, 11^b connect to angles of the arch 12 while opposite end portions thereof connect to the arch 11 slightly below the angles thereof. The arch 11 also carries a supplemental telescoping cross member 11^c beneath and parallel with its main cross member and at the same altitude as the longitudinal bars 11^a, 11^b. The arches 10, 11 preferably are connected at their centers by a bar 16 arranged at right angles thereto and provided with slide bearings on the cross members of the arches and adapted to be fixed thereto by set screws 16^a; and the arches 11, 12 preferably are connected at their centers by a bar 17 at right angles thereto, and provided with slide bearings at its ends on the cross member of the arch 12 and the supplemental cross member 11^c of the arch 11 and adapted to be secured by set screws 17^a. Across-bar 18 is mounted transversely of the structure and is provided with slide bearings at its ends on the side bars 10^a, 10^b and adapted to be fixed thereto by set screws 18^a. The cross-bar 18 may be moved into any desired position within the lengths of the side bars 10^a, 10^b in order to adjust the devices carried thereby relative to the body of a patient occupying the bedstead, and the longitudinal bar 16 also may be moved laterally into any desired position within the lengths of the cross-bar 18 and the cross members of the arches 10, 11 in order to adjust the devices carried thereby relative to the body of the patient.

A floating bar or hanger bar 20, preferably tubular in form, is arranged beneath and approximately parallel with the longitudinal bar 16 and is supported by or suspended from said longitudinal bar and the cross-bar 18, preferably by bandage strips or straps 21, 22, 23, 24 which are looped or wrapped around said hanger bar and also are looped or wrapped around the cross-bar. A sufficient number of bandage strips or straps 21, 22, 23, 24 are employed to support, and steady the floating bar or hanger bar 20 from and relative to the longitudinal

and cross bars. Bandage strips or straps 25 are fixed to and depend from the hanger bar 20 and extend beneath the bandaged and splinted leg of the patient and are adapted to suspend, sustain and support said leg. The injured leg of the patient may be supported at any desired altitude or angle, either straight or flexed at the knee by relative adjustments and arrangements of the splints and bandage strips or straps 25, and torsional or rotary adjustment of the injured leg may be effected, either by the attendant or by the patient, by manual rotary adjustment of the floating or hanger bar 20.

An elbow-shaped or right angled bar 26 telescopes at one end within one end portion of the hanger bar 20 and depends at its other end portion vertically. The right angled bar 26 may be adjusted to any degree of telescoping in the bar 20 and such degree is determined and maintained by a set collar 27 on the right angled bar abutting the hanger bar. A fork is formed in the lower end portion of the depending member of the right angled bar 26 and a pulley 28 is adjustably mounted in said fork. A cord 29 runs over the pulley 28 and carries a weight 30 at one end and the opposite end of said cord is adapted to be tied to an appliance such as an ordinary Buchs extension put on the ankle or shin of the injured leg. Thus provision is made for applying extension or stretching strain to the injured leg through the cord 29, weight 30 and Buchs extension, which is adjustable through variations of the weight and also through the telescoping arrangement between the bars 26 and 20. The arrangement for applying extension coupled with the arrangement for sustaining the leg and permitting rotary adjustment thereof fully cares for and protects the injured leg and permits various adjustments of position of the trunk, arms and head of the patient. For instance, the patient may be lifted, or raise himself by pulling on the cross-bar of the arch 11, to an upright position, which is advisable for several reasons, including avoidance of hypostatic pneumonia superinduced by constant recumbent posture, and for convenience in evacuation, and to rest the patient by mere change of position. The patient also is permitted by this arrangement to turn sidewise in either direction, the trunk articulating on the hip joint relative to the injured leg, or the patient may place his trunk or have it placed at various lateral angles to the injured leg without disturbing the alinement or extension or fixed flexure of said leg.

A floating bar or hanger bar 31 is arranged beneath and approximately parallel to the longitudinal bar 17 and is supported by flexible hangers 32 to a sleeve or drum 19 mounted for rotation on said bar. Bandage strips or straps 33, 34, 35, 36 of any desired

number (or even a hammock not shown) may be suspended from the floating or hanger bar 31 and extend beneath the trunk and head of the patient. The arrangement of the latter bandage strips or straps preferably is as follows: The strips or straps 33, 34 would be spaced apart and cross beneath upper and lower portions of the buttocks in order to sustain said buttocks and permit evacuation between them; the strip or strap 35 would extend beneath and support the lumbar regions; and the strip or strap 36 would extend beneath and support the shoulders, being looped over the arms in a common manner and also being provided with a shorter chord-arranged strap to support the head. One end portion of the drum or sleeve 19 is provided with a ratchet wheel 37 adapted to be engaged by a pawl 38 on the arch 12 and a hand wheel 39 is mounted on the opposite end portion of said drum and is adapted for manual operation to rotate the same. The bandage strips or straps 32 are fixed to and adapted to be wound on the drum or sleeve 19 and in the rotation of said drum in one direction the floating bar or hanger bar 31, the bandage strips or straps 33, 34, 35 and 36 and the body of the patient are lifted. This arrangement is advantageous in that it permits entire removal of the patient's body from the bed and makes it easier for the attendant to handle such body. Manual rotation of the handle or floating bar 31 may be employed to effect torsional or rotary adjustment of the body of the patient independent of the injured leg. It is to be understood that the bandage strips or straps 33, 34, 35, 36 may be adjusted to any desired length in order to support the body either recumbent or in any inclined position or to support the head in any desired relation to the trunk.

I claim as my invention—

1. A surgical appliance, comprising an adjustable arched frame, a floating bar adjustably suspended thereon, a right angled bar carried by the floating bar and adjustable relative thereto, extension means carried by the right angled bar, and suspensories carried by and adapted to be wound on the floating bar.

2. A surgical appliance, comprising an adjustable arched frame, a floating bar adjustably suspended thereon, a right angled bar carried by the floating bar and adjustable and pivotal relative thereto, extension means carried by the right angled bar, and suspensories carried by and adapted to be wound on the floating bar.

3. A surgical appliance, comprising an arched frame, a floating bar adjustably suspended thereon, a right angled bar carried by the floating bar and adjustable relative thereto, extension means carried by the right

angled bar, and suspensories carried by and adapted to be wound on the floating bar.

4. A surgical appliance, comprising an adjustable arched frame, longitudinal bars
5 mounted on said frame between the sides thereof and adjustable independently of each other transversely of the frame, separate and independent floating bars suspended adjustably from the longitudinal bars, a
10 right-angled bar carried by one of the floating bars and adjustable relative thereto, ex-

tension means carried by the right-angled bar, and separate and independent suspensories carried by and adapted to be wound on the respective floating bars.

Signed by me at Marshalltown, Iowa, this
4th day of October, 1910. 15

NORMAN E. MIGHELL.

Witnesses:

G. W. MILLER,
C. W. PATTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."