No. 653,179.

Patented July 3, 1900.

J. G. HUGHES.

SPLINT.

(Application filed Sept. 14, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1,

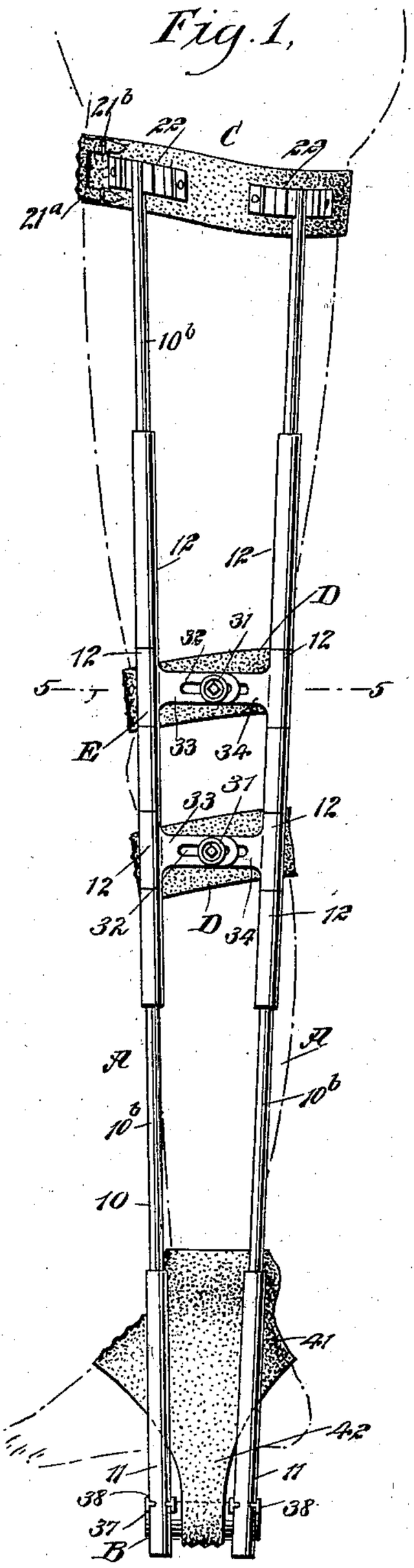


Fig. 2,

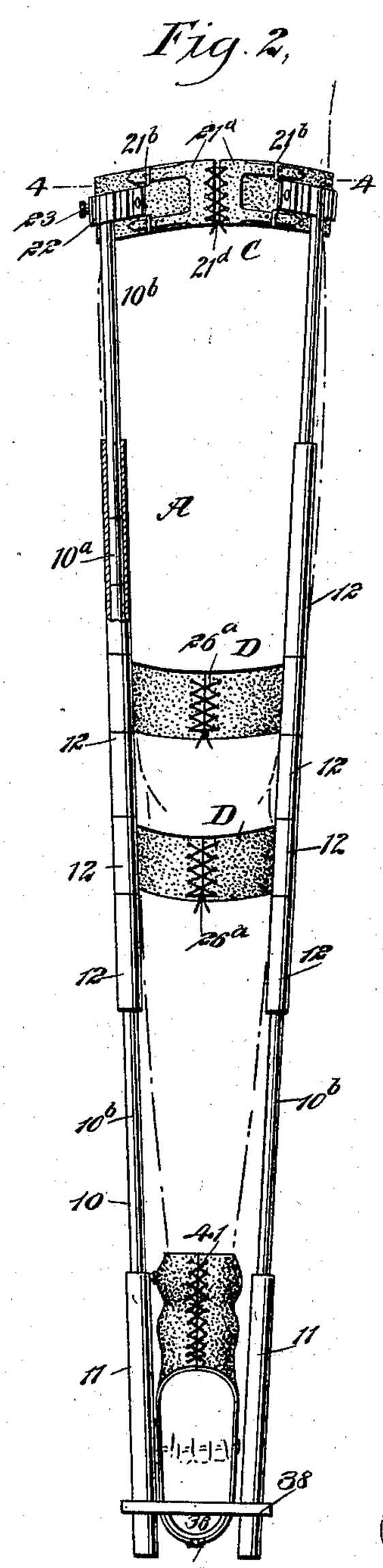
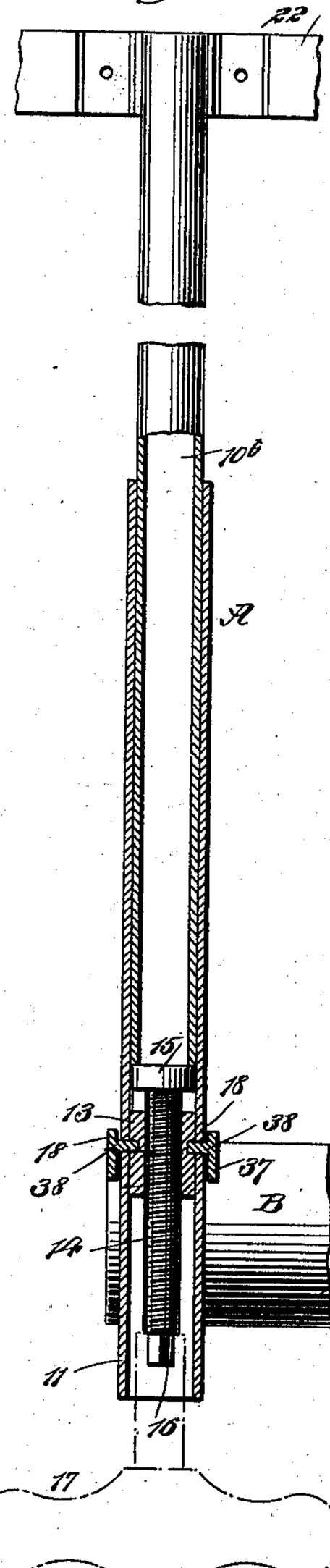


Fig. 3,



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(No Model.) 2 Sheets—Sheet 2.

Fig. 4.

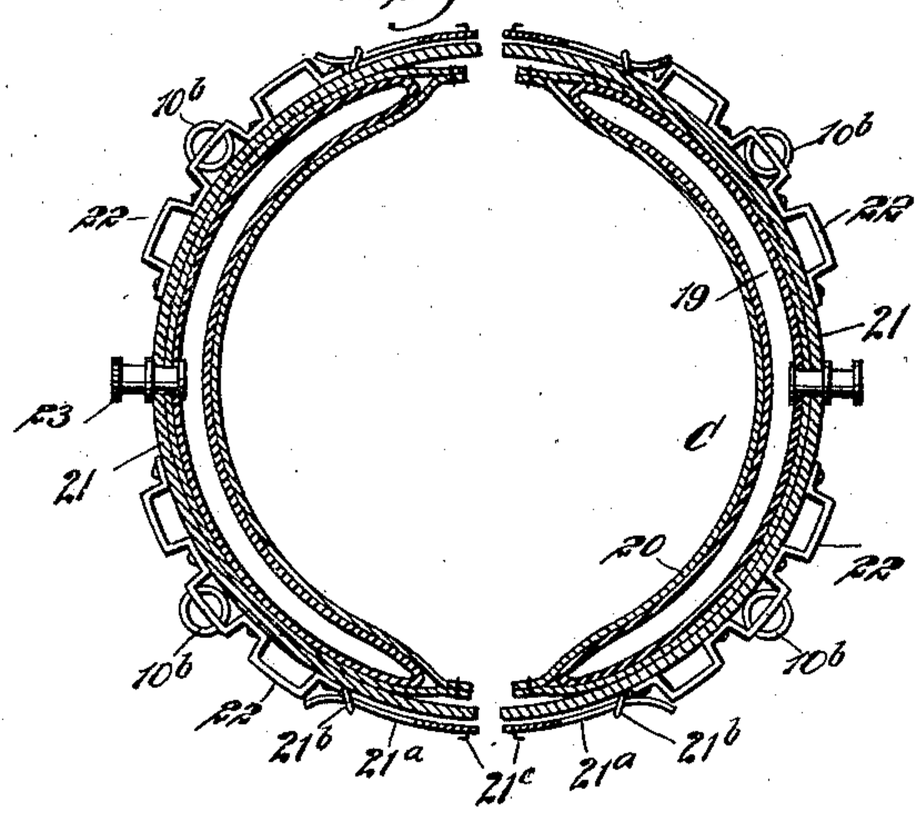


Fig. 5.

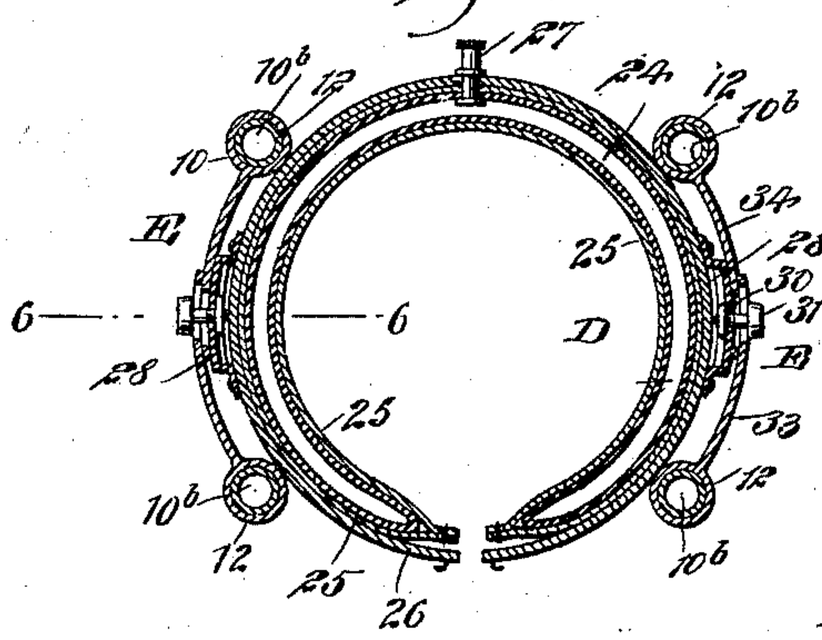


Fig. 6.

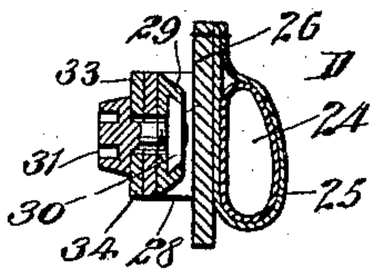


Fig. 7.

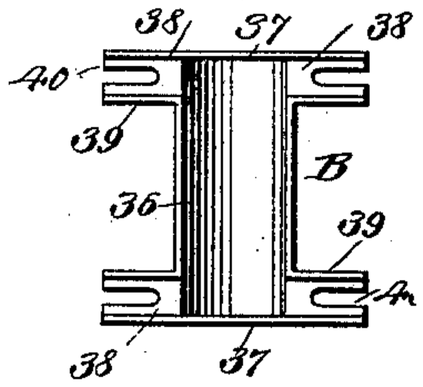
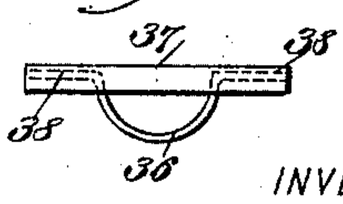


Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES GILBERT HUGHES, OF PORT ARTHUR, TEXAS.

SPLINT.

SPECIFICATION forming part of Letters Patent No. 653,179, dated July 3, 1900.

Application filed September 14, 1899. Serial No. 730,478. (No model.)

To all whom it may concern:

Be it known that I, JAMES GILBERT HUGHES, of Port Arthur, in the county of Jefferson and State of Texas, have invented a new and Improved Splint, of which the following is a full, clear, and exact description.

One object of the invention is to provide a splint especially adapted for use upon the lower limbs, but which may also be employed in treating fractures of the upper limbs, and to so construct the splint that it will be simple and readily applied, and when in use the fractured member may be inspected at any time and the wound properly dressed without disturbing the union of the parts or interfering in any way with the process of healing.

Another object of the invention is to provide a splint which can be applied with ease and precision and adjusted in a manner to secure perfect extension and fixation without pressure in the process on any part of the limb, preventing shortening or deformity after a fracture of any of the bones of the leg.

A further object of the invention is to provide the splint with pneumatic or hydraulic pads so located and constructed that pressure will be evenly distributed upon the limb.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improved splint applied to a leg. Fig. 2 is a rear elevation of the improved splint. Fig. 3 is a longitudinal vertical section through one of the stays of the splint, the section being drawn on a large scale. Fig. 4 is a horizontal section taken practically on the line 4 4 of Fig. 2. Fig. 5 is a horizontal section taken substantially on the line 5 5 of Fig. 1. Fig. 6 is a transverse vertical section taken substantially on the line 6 6 of Fig. 5. Fig. 7 is a plan view of a stirrup used in connection with the device, and Fig. 8 is an end view of the said stirrup.

In the construction of the splint four stays A are employed, two being adapted to be located at each side of the fractured limb. Each of the said stays consists of a sectional body 10 and a lower receiving-section 11, in which the body is adapted to slide or telescope; but both the body 10 and receiving-section 11 of a stay may be made tubular, as illustrated in Fig. 3, and each stay A is provided with a series of sleeves 12, loosely mounted on the body 10. The body 10 of a stay is in two or more sections, and the said sections fit closely in the sleeves 12. Short pieces or sections 10^a of the body 10 (shown in Fig. 2) are furnished with each splint, the auxiliary sections 10^a being about one inch or upward in length, and when introduced into the sleeves 12 between the main sections 10^b of the body A serve to make the body of the stay any desired or required length.

A nut 13 is secured in the lower or receiving section 11 of each stay, as shown in Fig. 3, and a screw 14 is passed through said nut, the upper end of which screw is provided with a head 15, arranged to engage with the lower end of the body 10 of a stay, while the opposite end 16 of the screw is made polygonal in order to receive a suitable key 17. By manipulating the screw 14 through the medium of the key 17 a stay may be lengthened or shortened within prescribed limits as occasion may demand, and as the nut 13 travels with the lower section 11 of the stay the said nut is adapted to carry with it a stirrup B, to be hereinafter specifically described. The said stirrup is provided with sections that enter slots 18 in the front and rear of a lower or receiving stay-section 11 and the nut 13, carried by said section, as shown in Fig. 3.

A pad C is provided for the thigh or upper portion of the leg. This pad consists of two or more tubular sacks 19, as shown in Fig. 4, which are bent in the form of a segment of a ring and are adapted to be inflated by compressed air or gas, or said sacks may be filled with water, if desired. Each sack 19 is located within a casing 20, and the casings 20 are preferably made of thin leather. The sacks are attached to segmental sections of a band 21, preferably made of stout leather or other desirable material, and the sections of the band 21 are adapted to encircle the leg. The ends of the segments or sections of a band are provided with straps 21^a, usually attached thereto by buckles 21^b, and studs or hooks 21^c are

secured to the outer faces of the opposing or inner ends of the straps 21^a, as shown in Fig. 4, whereby the ends of the pad C may be connected and drawn together as tightly as desired by laces 21^d or their equivalents. (See Fig. 2.)

Staples 22 are located at each side of the pad C. These staples are usually four in number and are correspondingly placed at the sides of the pad, as shown in Fig. 4. Preferably each staple comprises three members or sections, as is also shown in Fig. 4, and the central section of each staple 22 is adapted to normally enter a slot made in the upper end of the body 10^b of a stay A. Any approved form of valve 23 may be employed for inflating or filling the tubular sacks 19 of the pad. The staples 22 serve as upper bearings for the stays, and when short adjustments of the stays are required this may be accomplished by carrying the stays from one section of a staple to the other.

In addition to the hip or upper pad C one or more (preferably two) knee-pads D are employed. These knee-pads consist of an inflatable sack 24, located within a casing 25, the casing being attached to the inner face of a split band 26, of stout leather, and the band is provided at its ends upon its outer face with hooks similar to the hooks on the band of the pad C, adapted to receive lacings 26^a or the equivalent thereof, and fluid or gas is supplied to the sack 24 by means of a valve 27. A staple 28 is secured to each side of the band 26 and at the outer face of each pad D, and each staple 28 is provided with a dovetail groove 29 in the under face of its longer member or that which is concentric with the pad, as shown in Fig. 6, and a nut 30 is located in the dovetail groove 29 of each staple 28, the nut receiving a screw 31, provided with a suitable head. Each screw 31 passes through registering slots 32, made in overlapping shanks 33 and 34 of clips E, each shank being attached to an intermediate sleeve of the body portion of a stay A. Each clip connects the stays at one side of the limb, and owing to the adjustment of the sleeves 12, and consequently the adjustability of the clips E, the knee-pads may be given any desired inclination and may be held in adjusted position, or the said knee-pads may be raised or lowered, as may be found necessary.

Each splint is provided with a stirrup B, heretofore referred to, and, as shown in Fig. 7, this stirrup is trough-shaped, being semicircular in cross-section, its convexed surface facing downward, and a flange 37 is located at each end of the trough-body of the stirrup, extending above and below its upper edge, as shown in Fig. 8, and likewise beyond each side at a right angle to the sides, as shown in Fig. 7. At each end of the trough-body 36 of the stirrup a horizontal arm 38 is projected from each side of the said body, as is also shown in Fig. 7, the flanges 37 of the body of the stirrup likewise constituting flanges for the outer side edges of the said arms 38, and each arm 38 is provided with a longitudinal slot 40, extending from its outer end a desired distance toward the body 36 of said stirrup, and an inner flange 39 is also preferably provided for each arm 38.

In attaching a stirrup to the stays the slotted portions of the arms 38 are made to straddle the lower sections 11 of said stays and the bifurcated portions of the arms 38 enter the slots 18 in the lower sections 11 of the stays and into the nuts 13 contained therein, as shown in Fig. 3.

A sock 41 is used in connection with the splint. The sock is provided with a strap 42, which strap engages with the under or convexed face of the stirrup B, as shown in Figs. 1 and 2. Thus it will be observed that the splint may be quickly placed in position and the pads accurately and readily adjusted and that the splint may be quickly lengthened or shortened, as occasion may demand. Further, it will be noted that any amount of tension may be brought to bear longitudinally on the leg. The stirrup B is directly in line with the longitudinal axis of the bone, and is thus rendered exceedingly effective.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A splint consisting of adjustable stays each comprising a body-section and a lower receiving-section in which the body-section is adapted to telescope, a stirrup carried by the lower receiving-sections, and pads carried by the body-sections of said stays, substantially as described.

2. A splint comprising adjustable stays each consisting of a sectional body, a receiving-section for the lower part of the body, sleeves mounted on the body, and a stirrup and pads carried by said stays, substantially as set forth.

3. A splint consisting of adjustable stays, pads connected with the said stays, and a stirrup provided with bifurcated arms connected with the corresponding sections of the stays, as described.

4. In a splint, a telescopic stay, a nut located in one section of the stay, a screw carried by said nut, arranged for engagement at one end with an entering section of the stay, and means for turning the said screw, as described.

5. A splint consisting of a series of adjustable stays, one section being adapted to slide in the other, the receiving-section being provided with an adjusting device adapted for engagement with the entering end of the entering section, and a stirrup removably attached to the receiving-sections of the stays, for the purpose set forth.

6. In a splint, the combination, with adjustable stays and a stirrup carried thereby, of adjustable pad-supports connected with the stays, and pads adapted for attachment to said supports, each pad comprising an in-

flatable section and casing-section, the said pads being divided at a point in their circumference, and means for connecting the ends of a pad at such division, for the purpose described.

7. In a splint, the combination with a series of stays, of pad-supports arranged for connection with the stays, and pads adapted for attachment to said supports, each pad comprising an inflatable section and casing-section, the said pads being divided at a point in their circumference and means for connecting the ends of the pad, substantially as specified.

8. In a splint, a series of adjustable stays, a pad adapted to be carried at the upper ends of said stays, the said pad being provided at each side with means for engaging the said upper ends of the stays to form bearings for the same, and an adjusting device for each of said stays, substantially as described.

9. A splint consisting of a series of adjustable stays each comprising a body and a lower section, inflatable pads arranged for connection with the said stays, devices carried by one of said pads and with which the upper ends of the body-sections of the stays are removably connected, the said devices serving as upper bearings for the stays, and a stirrup removably attached to the lower sections of the stays, the said lower sections being provided with adjusting devices adapted for engagement with the body-sections of the stays, substantially as set forth.

10. In a splint, a series of stays, clips each comprising a sleeve loosely mounted on one of the stays and a shank extending from said sleeve, the shanks of the clips carried by the stays at each side of the splint being adapted to overlap, a pad for said stays, and means for connecting the overlapping shanks of the clips with each other and with the pad, substantially as set forth.

11. A splint comprising four stays, two of said stays being located at each side of the apparatus, the said stays each consisting of telescopic sections, pads connected with the said stays, a nut secured in the lower or receiving section of each stay, a screw extending through said nut and adapted to engage the lower end of the entering section of the stay and a stirrup provided with arms, each arranged to engage one of the receiving-sections of the stays, and the nut carried thereby, substantially as set forth.

12. In a splint having adjustable stays, the combination with the lower sections of the several stays, of a stirrup provided with arms adapted to engage slots formed in the said sections, substantially as described.

13. In a splint, the combination with the adjustable stays, of a stirrup carried by said stays and having a concaved under or lower face, and a sock provided with a strap adapted to engage the concaved face of the stirrup, substantially as shown and described.

14. In a splint, a stay made in sections, auxiliary sections for said stay, and sleeves for holding the sections in position, substantially as described.

JAMES GILBERT HUGHES.

Witnesses:
AMBROSE MIKS,
ROBERT A. BENNET.