

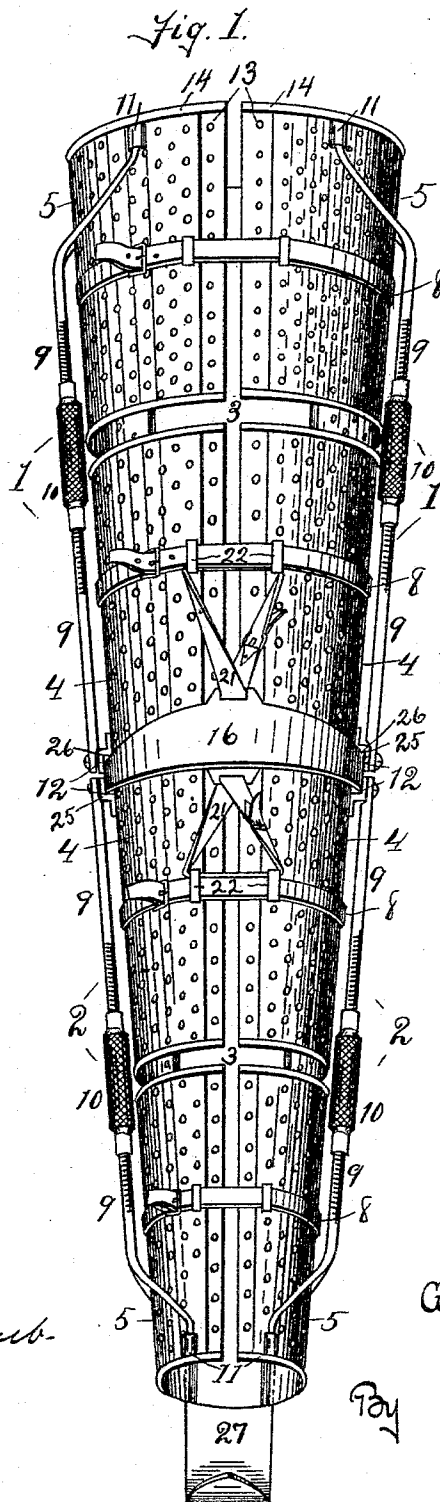
(No Model.)

2 Sheets—Sheet 1.

G. W. TURNER.
SURGICAL SPLINT.

No. 412,213.

Patented Oct. 1, 1889.



Witnesses:
H. M. Moore.
W. H. Holcomb.

Inventor.
George W. Turner.

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Attorney.

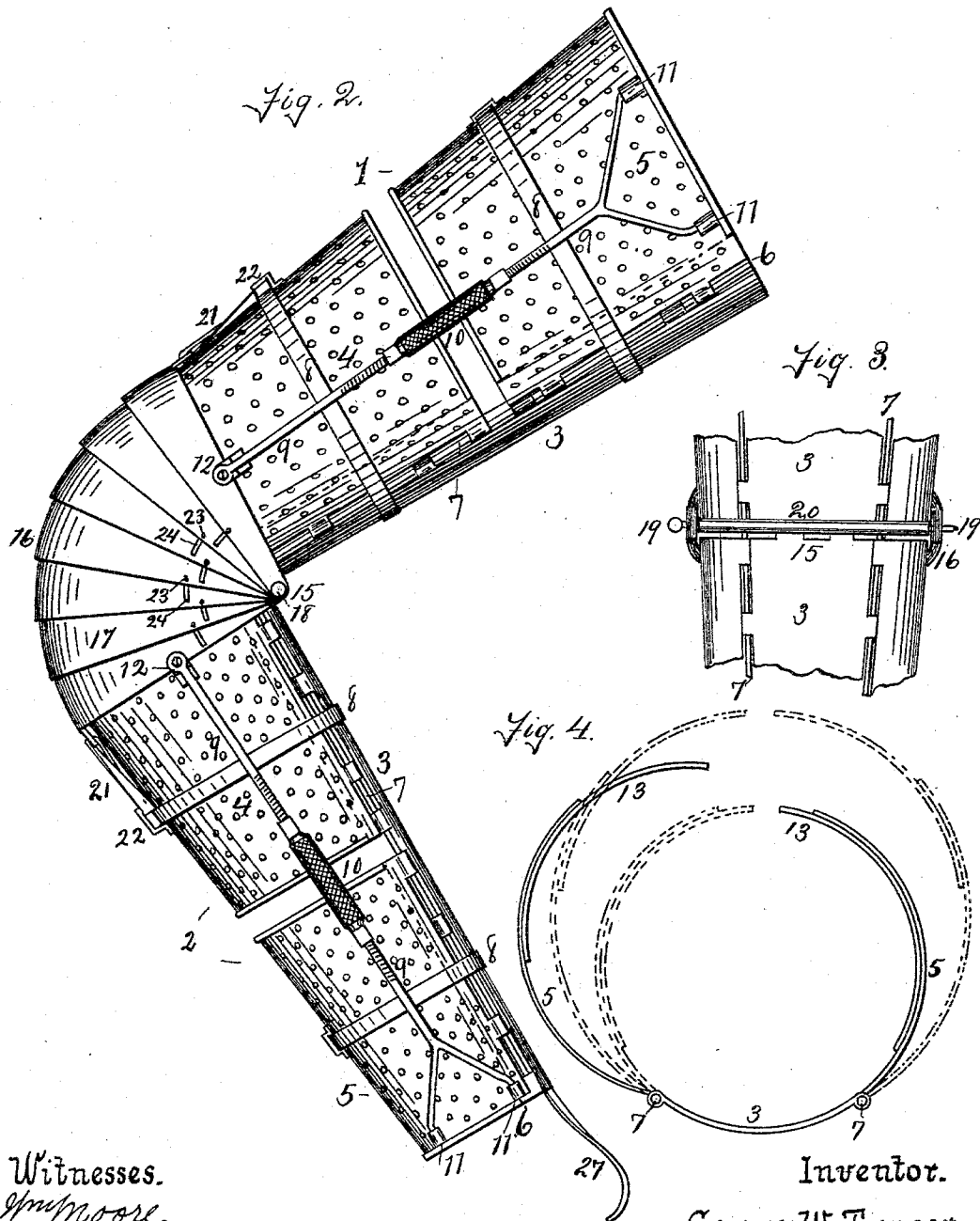
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Witnesses.
J. Moore
Wallace Holcomb

Inventor.
George W. Turner.

By *Turner*
Attorney.

UNITED STATES PATENT OFFICE.

GEORGE W. TURNER, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO
C. N. PARKER, OF SAME PLACE.

SURGICAL SPLINT.

SPECIFICATION forming part of Letters Patent No. 412,213, dated October 1, 1889.

Application filed March 22, 1889. Serial No. 304,297. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. TURNER, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Surgical Splints; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of surgical splints in which the splint is constructed in two jointed sections adapted to fit the upper and lower parts of the limb, and in which the plates of each section are adjustable independently of those of the other section; and the invention consists in features of improvement in such splints.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the splint. Fig. 2 is a side view showing the construction and operation of the joint; Fig. 3, a rear or under side detail view of the joint; and Fig. 4, a cross-section of the splint, showing its capacity of counter-extension.

Like characters of reference designate corresponding parts in all of the figures.

In the drawings the invention is illustrated as adapted for use as a leg-splint, and it will be so described; but it is obvious that the same construction is applicable to a splint constructed for use in case of fracture of the arm.

The splint is composed of two principal sections 1 and 2, adapted, respectively, for the thigh and lower portion of the leg and connected by a suitable joint at the knee. The two sections are substantially similar in construction, and hence but one section is described in detail, the only difference consisting in the circumference embraced, the general form of the entire splint tapering from upper to lower extremity. Each section is composed of a back 3, of suitable length and in one piece, preferably slightly curved in

cross-sections to correspond with the form of the back of the limb. These two back sections 3 3 are hinged together at the point corresponding to the position of the knee and constitute the foundation of the splint. To the opposite edges of the back are attached two pairs of curved plates 4 4 and 5 5 by means of a hinge-joint, as shown at 6 in Figs. 2 and 3. This hinge is so formed that each of the plates 4 and 5 may slide a short distance upon the pin 7 of the hinge, which is retained fixed to the back 3, by means of which construction the two pairs of plates may be drawn near together or pushed apart, while still retaining connection with the back. The plates 4 and 5 are of such form and size and of such curvature as to nearly or quite inclose the limb when in position, and suitable straps 8 8 are provided for retaining them in place and for the purpose of exerting as great a pressure as may be desirable. By unfastening the strap the plates may be thrown apart, thus opening the splint for being placed upon or removed from the limb.

To each of the plates 4 and 5, at a point near the middle of the outside of the same, is attached a rod 9, of about the length of each plate. Each of said rods has a screw-thread formed thereon at the inner end, the two rods on the same side of the section having oppositely-cut threads, and the two inner extremities of the said rods being joined by means of an elongated nut 10, having right and left female screw-threads formed therein in the opposite ends to correspond therewith. By turning the nut 10 it will be observed that the two sections may be pushed apart to a distance equal to about the length of the nut, and that both sides may be drawn apart uniformly and at the same time, or one side may be elongated separately or to a greater extent than the other, as the requirements of each particular case may dictate. These rods are preferably attached to the outer plates 5 5 of each section by means of branches formed thereupon, the ends of the said branches being removably inserted in sockets secured to the plates near the outer end, as shown at 11 11, for the purpose of distributing the pressure, when the nuts are turned, as equally as

possible. The rods upon the inner sections 4 4 are attached thereto by a hinge-joint, a bracket or lug 12 being secured to the plates near the inner end, and a screw or rivet passing through the same and the end of the rod constituting the joint. This bracket 12 has a special form, the purpose of which will be hereinafter described.

To permit of the adaptability of the splint for use where a larger circumference is required, extension-plates 13 13, curved to correspond with the plates 4 and 5, are attached to the latter, so as to slide out or in upon the same by means of a lip or flange 14 turned up at each of the opposite edges thereof and embracing the edges of the plates 4 and 5 in the groove thus formed. The plate 13 may be pushed in, so as to be entirely included within the plates 4 and 5, or may be drawn out so as largely to increase the circumference of the splint, all the plates being preferably of sufficiently yielding material to be easily conformed to the approximate shape of the limb.

It will be observed from the foregoing description and by reference to the drawings that the two principal sections of the splint are entirely separate and distinct in operation, and either section may be manipulated or adjusted at will without disturbing the other. The two sections are connected by means of the hinge-joint 15 uniting the backs of the two sections, and which joint, when the splint is in position, comes directly underneath the knee-joint, by which arrangement the knee may be flexed at pleasure, with no strain upon any of the adjacent parts caused by the splint. The bending of the knee will, however, separate the two sections at the front, and for the purpose of completing the covering at this point a collapsible cap 16 is provided. This cap is composed of a series of substantially lune-shaped plates 17, pivoted together at their angles, as at 18, in such a manner as to fit closely one within another, thus, when closed, taking up only the space of a single piece in width, and when drawn apart forming a cap embracing an angle of about ninety degrees between its opposite edges, as shown in Fig. 2. The plates are pivoted together at their angles on each side independently, and the pivot is preferably in the form of an eyelet, through which may be passed a pin 19, to hold the same in place.

For the purpose of always retaining the cap in proper position with reference to the two splint-sections to the back 3, as nearly as possible to the hinge is attached a tube 20, through which the pin 19 passes and by which it is held in place. To remove the cap it is only necessary to withdraw the pin, when the former is entirely disconnected from the rest of the splint. The cap is extended to the same extent and simultaneously with the bending of the knee, by reason of the inner of the lune-shaped plates being connected with the two splint-sections by means of a strap or

similar device 21, each strap being passed through a loop 22, mounted upon the adjacent sections. The plates act upon one another by means of a lug or pin 23, projecting inwardly from each plate and engaging with a slot 24, formed in the plate next underneath it. The position of the pin 23 and the length of the slot 24 are so arranged that the pin moves in the slot until only a small portion of one plate overlaps the other, when the pin comes in contact with the end of the slot and carries the lower plate along with the upper, and so on through all the plates.

The brackets 12, before mentioned, have L-shaped arms 25, projecting toward each other, so that when the two sections are brought into the same line, as when the limb is straightened, the two projecting arms on each section of the splint nearly touch, leaving a recess between the same and the sides of the sections about equal to the combined thickness of the plates forming the cap. At the sides of this recess the body of the bracket forms a shoulder 26, against which the edges of the cap-plates abut, and by means of which the plates are pushed together by the straightening of the limb, as shown in Fig. 1. By means of this arrangement the limb is supported, and the working of the joint accomplished easily and without strain.

At the back of the lower section is a foot-rest 27, attached thereto in such a manner as to slide longitudinally in suitable ways upon the back. The rest can thus be drawn out or pushed in to suit the requirements of various cases. When the splint is constructed for use as an arm-splint, the form of the rest may be changed to fit the hand and mounted in the same manner.

The principal results accomplished by this splint are that by its use the setting of a fracture upon either side of the joint may be accomplished independently and without the necessity of confining the joint in a cramped position, the fractured bones may be drawn apart easily and steadily and held in such a manner as to insure good results, and the joint is properly supported in such a manner as to be freely flexed without danger of disturbing a fracture above or below. The entire periphery of the limb is also embraced by the plates of this splint, so that no part of the limb is left exposed.

The materials composing the body of the splint may be of any kind in common use, preferably, however, of thin sheet metal.

A cap of larger size may be provided, if necessary, for use in cases where the size of the limb renders the fullest limit of counter-extension necessary.

I claim as my invention—

1. A splint for surgical purposes, consisting of a back, two pairs of suitably-curved inclosing-plates hinged to the opposite edges thereof and movable longitudinally with reference thereto by means of a sliding hinge, and means, substantially as described, for

drawing apart said sets or pairs of plates upon said back when bound upon the limb, as and for the purpose specified.

2. A surgical splint consisting of a series of curved inclosing-plates hinged at their edges to a suitable back, and an extension-plate attached to and movable upon each of said inclosing-plates by means of a lip formed upon the former and overlapping the opposite edges of the latter of said plates, substantially as and for the purpose specified, whereby the lateral extension of said plates may be increased.

3. A splint for surgical purposes, consisting of two sections adapted to inclose the upper and lower portions of the limb, respectively, each of said sections comprising a back having two sets of inclosing-plates hinged to the opposite sides thereof and movable longitudinally with reference thereto by means of a sliding hinge, the said two series of plates in each section having rods attached thereto upon the opposite sides thereof, an elongated nut uniting the adjacent ends of said rods upon each side by means of right and left screw-threads formed upon said rods and in the opposite ends of the nut, respectively, and a hinged joint connecting the ends of the backs of the two sections, substantially as and for the purpose herein specified.

4. In combination, in a splint for surgical purposes, two sections adapted to fit the up-

per and lower portions of the limb, respectively, and connected by a hinge-joint, a collapsible cap consisting of a series of lune-shaped plates pivoted together at their points and adapted to slide one within another, the said pivotal point being substantially in line with the joint of the hinge, the outer and inner of said plates being respectively connected with the adjacent splint-sections, and a pin or lug 23 in each of said plates working in a slot 24 in the next inner plate, substantially as and for the purpose herein specified.

5. In a splint for surgical purposes, two sections adapted to fit the upper and lower portions of the limb, respectively, and connected by a hinge-joint, in combination with a collapsible cap composed of a series of lune-shaped plates pivoted together at their points and adapted to slide one within another, the said pivotal points being substantially in line with the joint of the hinge, a pin or lug 23 in each of said plates, working in a slot 24 in the next inner plate, and lugs upon said splint-sections adapted to engage with the edges of said outer and inner plates when the joint is straightened, substantially as set forth.

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

GEORGE W. TURNER.

Witnesses:

WILLIAM M. CARSON,
F. W. LANE.