

[54] BONE SPLINT

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[51] Int. Cl. A61F 5/04

[58] Field of Search 128/92 A, 92 B, 92 R, 84

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2nd

[57]

ABSTRACT

Bone splints are provided which include a wire or pin
with an easily attachable and detachable retainer or
retainers secured thereto, which splints do not migrate
into the bones or tissue of the person undergoing
treatment.

3 Claims, 7 Drawing Figures

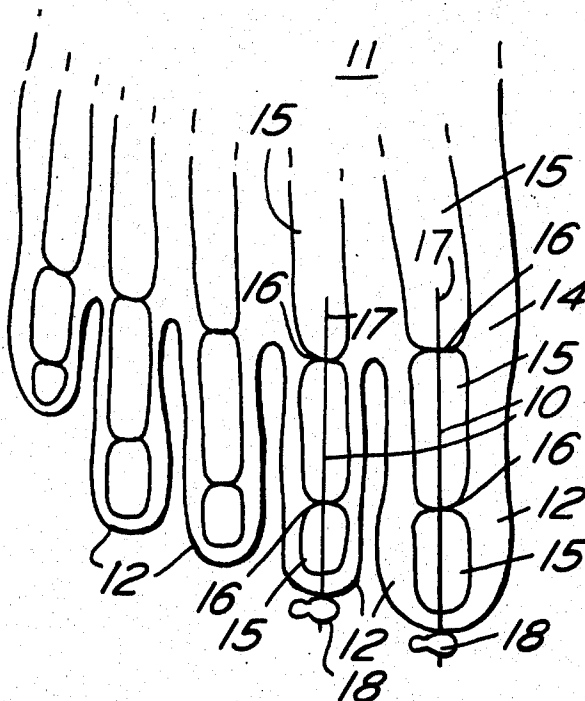


FIG. 1

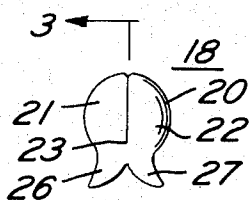


FIG. 2

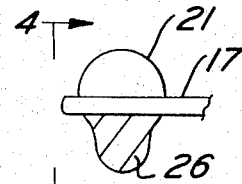
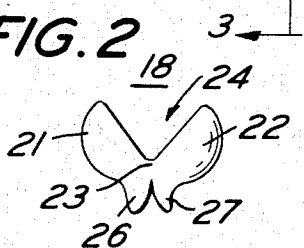


FIG. 3

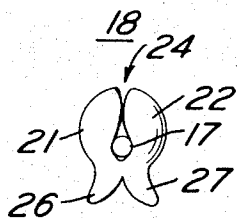


FIG. 4

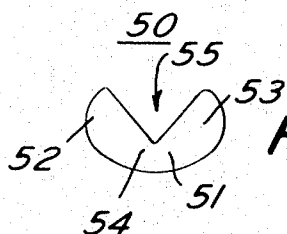


FIG. 5

FIG. 6

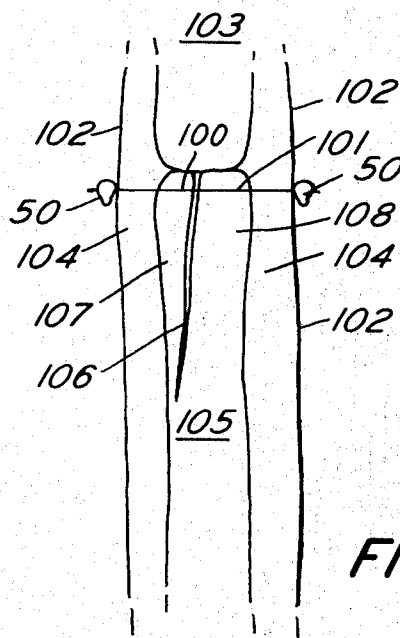
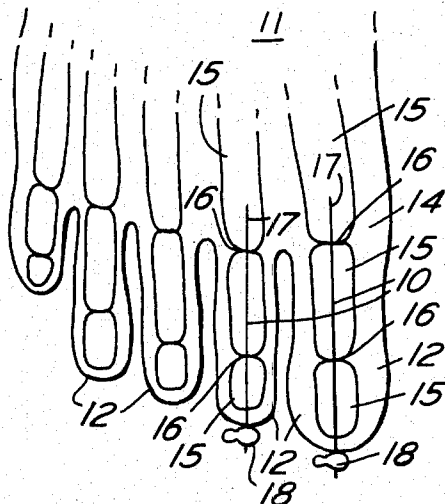


FIG. 7

BONE SPLINT**BACKGROUND OF THE INVENTION****1. Field of the Invention**

This invention relates to the wire type of immobilization or traction splint which is passed directly through skin, tissue and bones and retained therein for the duration of the treatment.

2. Description of the Prior Art

Bone splints are often used for the immobilization of bones and joints after fractures or reconstructive surgery. The reconstructive surgery can involve bones, joints, nerves, tendons and the surrounding soft tissue. After such surgery it is often necessary to immobilize the area, which immobilization is often difficult since the area may be one that is not readily supportable by casts or is contraindicated for plaster casts.

The wires, such as Kirschner wires, or pins, such as Steinman pins, used for immobilization or traction are placed through the skin, subcutaneous tissue, bone and also through joints. Where plaster casts are used for supportive purposes the wires or pins may be retained by the cast. Without plaster casts the wires or pins can migrate into the body and cause considerable damage, due to loss of immobilization or due to injury to the tissues or organs from contact with the wire or pin. It has also heretofore been proposed to twist the end of the wire or pin which protrudes but this weakens the wire and may break off.

The bone splint of my invention overcomes the present difficulties with such splints and has many advantageous features.

SUMMARY OF THE INVENTION

In accordance with the invention bone splints are provided, suitable for use on bones, joints and tissue after fracture and/or reconstructive surgery, the structure including a wire or pin having an attachable retainer on the end or ends thereof, to prevent migration.

The principal object of the invention is to provide a bone splint that is easily inserted and removed with positive retention when in place.

A further object of the invention is to provide a bone splint that may be used for either immobilization or traction purposes.

Other objects and advantageous features of the invention will be apparent from the description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part thereof, in which:

FIG. 1 is an elevational view of one embodiment of the retainer portion of the bone splint of the invention prior to opening up for use;

FIG. 2 is a view similar to FIG. 1 showing one embodiment of the retainer portion of the bone splint in a position ready to use;

FIG. 3 is a vertical sectional view taken approximately on the line 3—3 of FIG. 1 showing the retainer portion of the bone splint in use;

FIG. 4 is a vertical sectional view taken approximately on the line 4—4 of FIG. 3;

FIG. 5 is a view similar to FIG. 1 but showing another

embodiment of the retainer portion of the invention;

FIG. 6 is a view in phantom illustrating one form of the bone splint in place in bone joints of the foot for immobilization; and

FIG. 7 is a view similar to FIG. 6 showing another embodiment of the invention in place retaining a split bone together.

It should, of course, be understood that the description and drawings herein are illustrative merely and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings and FIGS. 1 to 4 and 6 thereof, one form of bone splint 10 is shown in assembled condition in a foot 11. The foot 11 is shown diagrammatically as including skin 12, subcutaneous tissue 14, bones 15 and joints 16. The splint 10 can include a wire 17, preferably of stainless steel or other non-corroding well tolerated material, and a retainer 18. The splint 10 is shown as passing through the skin 12, the tissue 14, into a bone 15, through a joint 16, into a second bone 15, through a joint 16 and into a third bone 15. This type of splint 10 is used where it is desirable to immobilize a joint and where one retainer 18 is required.

A preferred form of retainer 18, shown in FIGS. 1 to 4 includes a round head 20 which is split at the middle into halves 21 and 22. The halves are joined together at the portion 23 below the slot 24. The portion 23 forms a hinge for the halves 21 and 22. The half 21 has a wing portion 26 below the hinge 23 and the half 22 has a wing portion 27 attached thereto below the hinge 23. The wings 26 and 27 are adapted to be grasped by the fingers and when pressed towards each other cause the halves 21 and 22 to move apart about hinge 23 and to open up the slot 24. The retainer 18 may be installed on the end of the wire or pin 17 by placing the wire or pin 17 in slot 24 and squeezing the halves 21 and 22 together to retain the wire or pin 17 therein. Removal of the retainer 18 is obtained by squeezing the wings 26 and 27 together causing separation of the halves 21 and 22 and permitting the retainer 18 to be removed from the wire or pin 17. The retainer 18 is preferably formed of a soft easily bendable material such as lead or lead alloy, however any other suitable non-toxic, easily bendable material is suitable.

Another preferred form of retainer 50 is shown in FIG. 5 which includes a round head portion 51 with a central split forming halves 52 and 53, and a hinge or fulcrum portion 54 below the slot 55 formed between the halves. In this embodiment the retainer 50 may have its halves 52 and 53 pried apart, the wire or pin (not shown) placed in the slot 55 and then the halves squeezed together about hinge 54 around the wire or pin (not shown). The retainer 50 may also be formed of soft metal such as lead or a suitable alloy thereof or other material as desired.

Another preferred embodiment 100 of the bone splint of my invention is illustrated in FIG. 7. The structure in FIG. 7 includes a pin or wire 101 which has been passed through the outer layer of skin 102 of a leg 103, through the subcutaneous tissue 104, into and through a bone 105 and out through tissue 104 and layer of skin 102. The bone 105 had been fractured with a split 106

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into two parts 107 and 108, and is shown with the wire 101 passing through the bone parts 107 and 108 retaining them together. Retainers 50 placed on the wire or pin 101 outside of the skin 102 prevent undesired movement and can be installed or removed as previously explained. 5

It will thus be seen that a bone splint has been provided with which the objects of the invention are achieved.

I claim:

1. A bone splint for use in immobilizing tissue, bones or joints which comprises 10

an elongated metallic member which can be passed into or through the portion to be immobilized, and 15

at least one retainer of soft bendable material adapted to be detachably secured to said member at a selected location therealong,

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said retainer being of one piece and including a head with a surface for direct engagement of said surface with the body exteriorly thereof and for simultaneous gripping engagement by said head with said metallic member,

said retainer having two separable portions between which said metallic member is gripped and a bendable hinge portion connecting said separable portions for application to and removal of said retainer from said elongated metallic member, said separable portions having wings attached thereto below said hinge for actuation.

2. A bone splint as defined in claim 1 in which said metallic member is a wire.

3. A bone splint as defined in claim 1 in which said metallic member is a pin.

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