

July 24, 1951

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2,561,550

DEVICE FOR TREATMENT OF BONE FRACTURES

Filed May 28, 1948

2 Sheets-Sheet 1

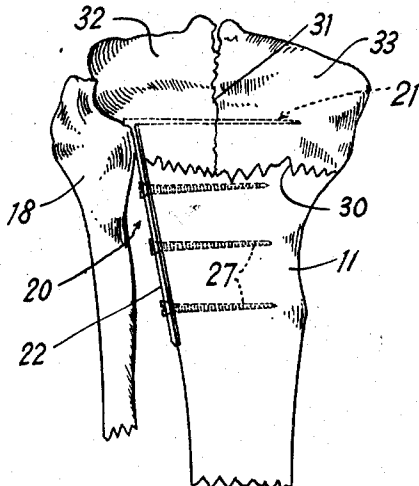


Fig. 3

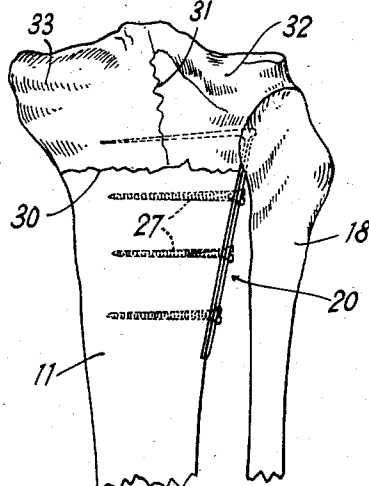


Fig. 4

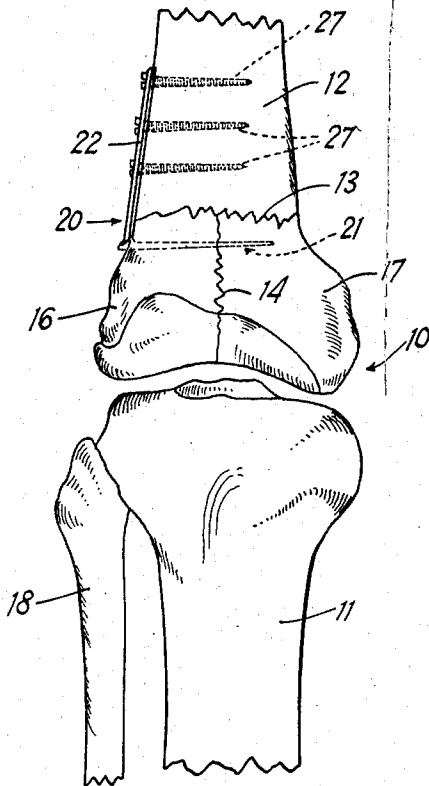


Fig. 1

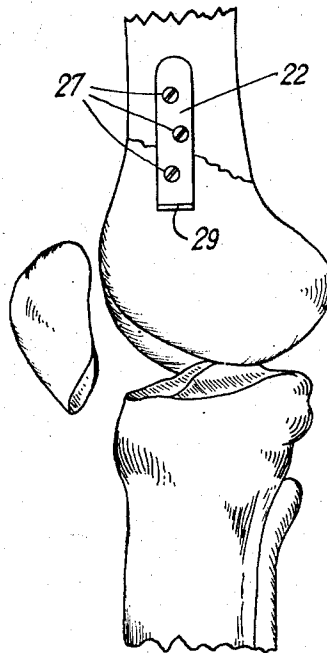


Fig. 2

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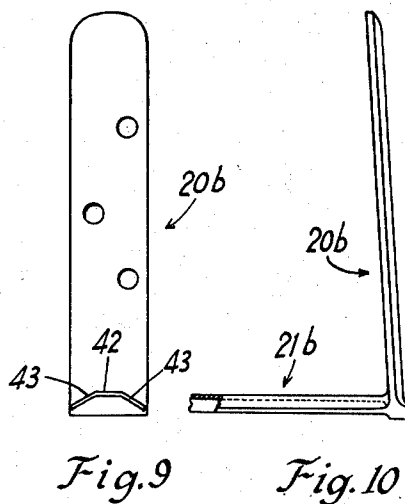
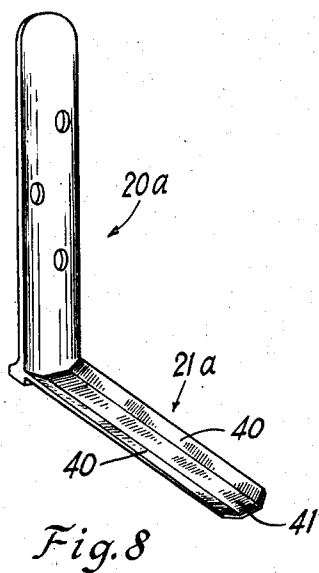
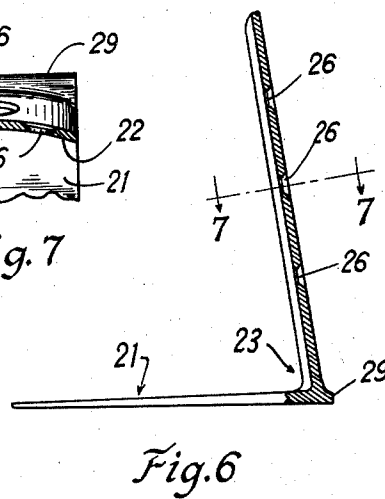
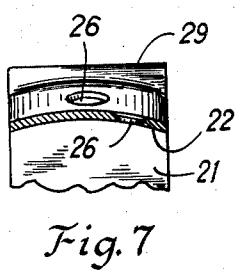
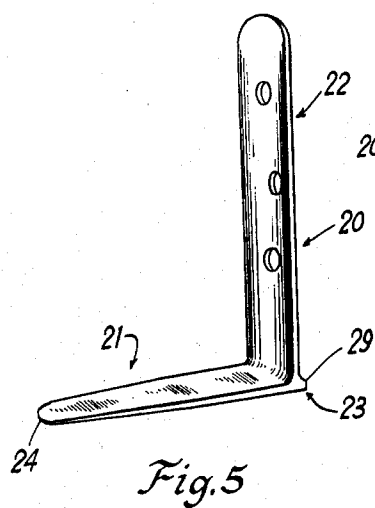
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DEVICE FOR TREATMENT OF BONE FRACTURES

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2 Sheets-Sheet 2



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DEVICE FOR TREATMENT OF BONE FRACTURES

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5 Claims. (Cl. 128—92)

1

This invention relates to devices for the treatment of supracondylar and "T-fractures" of the lower end of the femur and "T-fractures" of the upper end of the tibia.

An object of this invention is to provide a highly improved blade plate, which may be used in the treatment of supracondylar and "T-fractures" of the lower end of the femur and "T-fractures" of the upper end of the tibia involving the knee joint, which blade plate comprises a blade, which may be driven into the bone and a plate integrally formed with the blade and forming an acute angle therewith so as to approximate the angle of the femur or tibia in the region of the knee joint.

A further object of this invention is to provide a device of the character described, in which the plate is of transversely curved cross-section to fit the outer side of the bone structure and is formed with staggered openings to receive screws, which are screwed into the bone for holding the device in place during the healing of the fracture.

Yet a further object of this invention is to provide a device of the character described, which is formed at the junction of the blade and the plate with a drive heel or lip, which may be hammered to drive the blade into the condyles of the femur or the tuberosities of the tibia.

Yet another object of this invention is to provide a device of the character described, in which the blade decreases in thickness, as well as in width from the junction of the blade with the plate toward the outer end of the blade.

Yet another object of this invention is to provide a device of the character described, in which the blade is of concave cross-section so as to aid in preventing rocking of the device when attached to the bone structure.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter described, and of which the scope of invention will be indicated in the following claims:

In the drawings in which are shown various illustrative embodiments of this invention:

Fig. 1 is a front view of a knee joint wherein the femur has a "T-fracture" at its lower end and

2

showing a device embodying the invention, in position for treatment of the fracture;

Fig. 2 is a side elevational view of the structure shown in Fig. 1;

5 Fig. 3 is a front view of the upper end of a tibia and showing a device embodying the invention in position for treatment of a "T-fracture";

Fig. 4 is a rear view of the structure shown in Fig. 3;

10 Fig. 5 is a perspective view of a blade plate embodying the invention used for the treatment of a "T-fracture" at the lower end of the femur or at the upper end of the tibia;

Fig. 6 is a side elevational view of the device shown in Fig. 5 partly in cross-section;

15 Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 6;

Fig. 8 is a perspective view of a device embodying the invention and illustrating a modified construction;

20 Fig. 9 is a front view of the device embodying the invention and illustrating another modification, and

25 Fig. 10 is a side elevational view of the structure shown in Fig. 9 with parts broken away in the cross-section.

Referring now in detail to the drawing, there is shown in Fig. 1 a knee joint 10 comprising the upper end of the tibia 11, and the lower end of the femur 12. In Fig. 1 the lower end of the femur is shown to have a "T-fracture" including a fracture area 13 above the femoral condyles and a fracture area 14 extending from the fracture area 13 between the external and internal condyles 16 and 17. In the drawing the fibula 18 is also shown.

In accordance with the present invention, means is provided to treat the fracture 13, 14. To this end, there is provided a blade plate or device 20 comprising a blade portion 21 and a plate portion 22 extending therefrom and integrally formed therewith. The device 20 may be made of vitalium, which will create no galvanic currents in the body and will not rust and is perfectly inert. The blade 21 decreases in both thickness and width from the junction 23 toward the outer end of the blade. Thus, the front end or edge 24 of the blade 21 is rather thin and its front end is also rounded, as shown in the drawing.

The plate 22 is transversely curved, that is, its inner surface is concave. Said plate forms an acute angle with the blade 21. The angle between blade 21 and plate 22 is between 75° and 85°, preferably about 80°. Said plate is formed with a plurality of longitudinally spaced staggered externally countersunk openings 26. The bottom opening may be centrally located between the side edges of the plate, whereas the upper and lower openings are located on opposite sides of the center. The axis of each opening is preferably radial with respect to the curvature of the plate at each opening so that the axes of the three openings 26 are in different directions. Extending through the openings 26 are screws 27, which are screwed into the femur above the fracture area 13.

It will be noted that the blade 21 is driven through the condyle 16 and into the condyle 17, below the fracture area 13 and crosses the fracture 14. Thus the blade 21 is located below the fracture area 13.

As the juncture between the blade 21 and the plate 22 is a thickened lip or heel 29, which may be hammered for driving the blade 21 into the bone. To facilitate application of the device 20, the external condyle 16 may be formed with two spaced drilled holes, and the cortex chiselled therebetween to form a slot in the external condyle into which the blade may be driven more easily through the spongy bone. It will be noted that the blade 22 has a transverse curvature to fit the tapered portion of the femur just above the condyles, at the lower end of the femur. Also the angle of the blade 22 is such that it will contact the outer surface of the femur when the blade 21 is in substantially a horizontal position. In other words, the acute angle of the blade 22 substantially follows the acute angle of the outer surface of the femur above the condyles. The staggered holes give a better hold preventing rocking motion or back pull.

The length of the blade 21 is preferably about 2½" from the front tip thereof to the rear lip or hammer heel 29, so that the blade will not pass entirely through the condyles. The screws are preferably of somewhat shorter length than the blade.

In Figs. 3 and 4, there is shown the device 20 applied for treatment of a "T-fracture" at the upper end of the tibia. Thus, the "T-fracture" comprises a horizontal fracture area 30 and a fracture area 31 extending from the fracture area 30 upwardly between the tuberosities 32 and 33 of the tibia. The blade 21 is driven through the tuberosities whereas the plate 22 extends downwardly therefrom and contacts the outer surface of the tibia below its upper end. The device 20 in this use is also held in place by the screws 27.

In Fig. 3 there is shown a front view of the applied device and in Fig. 4 there is shown a rear view of the applied device. Here likewise, the acute angle between the plate 22 and the blade 21 is such as to conform substantially to the angle of the bone structure at the upper end of the tibia. To aid in driving the blade 21 into the bone, a hammer may be used for striking against the lip 29.

In Fig. 8, there is shown a device 20a embodying the invention similar to the device 20 with the exception that there is substituted for the flat blade 21, a blade 21a having upwardly and outwardly inclined side flanges 40, extending from a flat central bottom wall portion 41. Member

21a is likewise preferably tapered thin toward its front end.

In Figs. 9 and 10 there is shown a device 20b similar to the device 20a, with the exception that instead of blade 21a there is provided a blade 21b having a central flat wall portion 42 and downwardly and outwardly inclined side flanges 43 extending therefrom.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

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

1. A device for treating fractures comprising a member made of a single piece of metal and comprising a blade portion and a plate portion extending at an angle of between 75° and 85° to the blade portion and formed with a plurality of openings, said plate portion being of transverse curved cross-section being concave at its inner surface, and said device being formed with a heel at the junction of the blade and plate portions extending in a plane of the blade and beyond said junction, said blade portion decreasing in thickness toward its outer end.

2. A device for treating fractures comprising a member made of a single piece of metal and comprising a blade portion and a plate portion extending at an angle of between 75° and 85° to the blade portion and formed with a plurality of openings, said plate portion being of transverse curved cross-section being concave at its inner surface, and said device being formed with a heel at the junction of the blade and plate portions extending in a plane of the blade and beyond said junction, said blade being formed with longitudinally extending inclined flanges.

3. A device for treating fractures comprising a member made of a single piece of metal and comprising a blade portion and a plate portion extending at substantially 80° to the blade portion and formed with a plurality of openings, said plate portion being of transverse curved cross-section being concave at its inner surface, and said device being formed with a heel at the junction of the blade and plate portions extending in a plane of the blade and beyond said junction, said blade portion decreasing in thickness toward its outer end.

4. A device for treating fractures comprising a member made of a single piece of metal and comprising a blade portion and a plate portion extending at an angle of between 75° and 85° to the blade portion and formed with a plurality of openings, said plate portion being of transverse curved cross-section being concave at its inner surface, and said device being formed with a heel at the junction of the blade and plate portions extending in a plane of the blade and beyond said junction, said blade portion decreasing in thickness toward its outer end, said openings being staggered and screws extending through said openings.

5. A device for treating fractures comprising a member made of a single piece of metal and comprising a blade portion and a plate portion extending at substantially 80° to the blade por-

tion and formed with a plurality of openings, said plate portion being of transverse curved cross-section being concave at its inner surface, and said device being formed with a heel at the junction of the blade and plate portions extending in a plane of the blade and beyond said junction, said blade portion decreasing in thickness toward its outer end, said openings being staggered and screws extending through said openings, the front edge of said blade portion being rounded. 10

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