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FRACTURE SUPPORTING DEVICE

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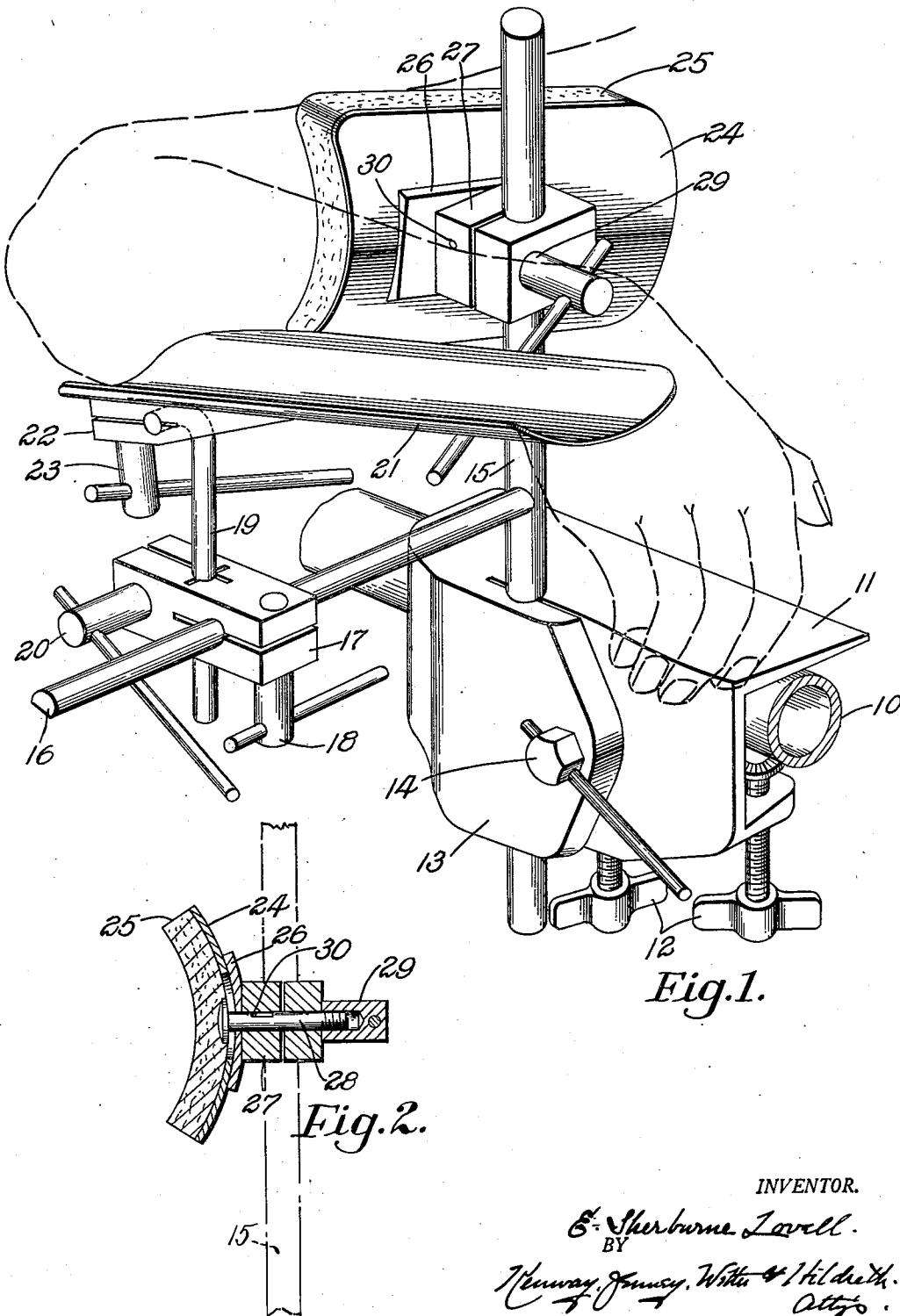


Fig. 1.

Fig. 2.

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FRACTURE SUPPORTING DEVICE

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This invention comprises a new and improved fracture supporting device for use in supporting the arm of a patient suffering from skeletal fracture while the latter is being immobilized by the application of a bandage, cast or splint. While the device of my invention is particularly useful in dealing with a Colles wrist fracture, it is useful in part in any case where the forearm is to be maintained under traction in setting bones and applying splints and the like.

Going more into detail, my improved supporting device comprises a main bracket adapted to be clamped to an operating table or any table upon which a patient might be placed, and including a rest for the forearm adjustably mounted in a substantially horizontal position, and an upper arm rest adjustably mounted in substantially vertical position and at such an angle to the general direction of the forearm rest that it will effectively resist traction applied to the forearm. Preferably and as herein shown, the forearm rest is upwardly concave or trough-shaped and of such length as to underlie substantially the full length of the patient's forearm, yet permitting the hand and wrist to be flexed downwardly and the wrist conveniently exposed for the surgeon's work or X-ray work upon it. The upper arm rest is also preferably concave so as to fit comfortably the contour of the upper arm as it extends at an angle to the forearm. The device as a whole is portable and may be clamped to the table, for example, in any desired or convenient location and upon either side of the table so that it is adapted to support either the right or left arm of a patient.

The forearm rest is mounted for substantially universal adjustment, that is to say, for height, for in and out horizontal adjustment, and for angular adjustment both vertically and horizontally. The upper arm rest may also be adjusted for height and angle and in its relation to the forearm rest.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings in which:

Fig. 1 is a view in perspective of the complete device showing a section of the operating table to which it is clamped and indicating in dotted lines the arm of a patient, and

Fig. 2 is a cross-sectional view through the upper arm support and its clamping connections.

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In Fig. 1 is shown a portion of one of the side rails 10 of an operating table, and while this is represented as circular in cross-section, it may well be of any other shape. The main bracket 11 of the device is channel shaped, presenting an open side designed to embrace the side rail 10 and provided with clamping screws 12 by which it may be securely fixed in place.

The main bracket 11 is provided with a vertical clamping section 13 and a clamping screw 14. Between the section 13 and the main body of the bracket is formed a vertical bore in which is adjustably fitted a vertical spindle 15. The spindle may be adjusted as to height and rotary position by loosening the clamping screw 14 and then secured in the desired position by tightening the same. The spindle 15 carries a horizontal arm 16 upon which is adjustably mounted a split clamping block 17 provided with a horizontal bore for the arm 16 and a clamping screw 18 which permits both in and out adjustment of the block upon the arm. The block 17 also has a vertical bore in which is adjustably fitted a vertical rod 19. The latter may be adjusted vertically and angularly in the block and clamped in the desired position by a horizontal clamping screw 20. The upper end of the rod 19 is bent to provide a horizontal journal and this is received in a split bracket 22 provided with a clamping screw 23. The bracket 22 is formed as a part of the forearm rest 21 which extends toward the right from its journal bearing and is upwardly concave to fit comfortably the patient's forearm. It will be seen that in addition to the various adjustments above enumerated, the rest 21 may be tilted if desired about its horizontal journal and clamped in the desired position by the clamping screw 23. The bracket 22 is secured to one end of the forearm rest 21 and the free end of the rest projects into unobstructed space so that a patient's wrist may be flexed over it as suggested in Fig. 1.

The upper arm rest 24 has a concave face directed away from the free end of the forearm rest and is provided with a pad or cushion 25 of felt or the like and is secured to a concave plate 26 which is fitted to its outer convex surface as best shown in Fig. 2. The body of the rest 24 is slotted to receive a clamping bolt 28 having an enlarged head which lies within the slot. A split clamping block 27 is slidably fitted upon the spindle 15 and provided with a horizontal bore for the clamping bolt 28. The latter is provided at its outer end with a clamping nut 29. The clamping bolt 28 is

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slotted within the split block 27 to receive a dowel pin 30 which projects through the block 27 and serves to prevent displacement of the block on the bolt 28 when the clamping nut 29 is released. It will be seen that by loosening the nut 29 the upper arm rest may be adjusted for height and angle in a horizontal plane about the axis of the spindle 15. The rest may also be adjusted as to angle in a vertical plane by reason of its slotted connection with the clamping bolt 28 and this adjustment, it will be observed, takes place about the center of curvature of the rest 24 itself.

In using the device above described, the device as a whole is clamped in position upon the rail 10 and then the two rests are adjusted to suit the convenience of the surgeon and the comfort of the patient. Such position is indicated in Fig. 1 by the dotted line representation of the patient's arm, from which it will be apparent that the flexed wrist is presented advantageously to the surgeon while the arm of the patient is fully supported and therefore relaxed and that forward traction upon the forearm is effectively resisted by the upper arm rest 24.

The horizontal arm 16 is flattened on its under side and the bore in the clamping block 17 through which it passes is similarly shaped so that the block 17 and the parts carried thereby are positively held against twisting on the arm 16. It will be noted that the horizontal journal formed by the upper end of the vertical rod 19 is of substantially the same length as the thickness of the bracket 22, with the result that when the clamping screw 23 is loosened the bracket 22 with the rest 21 may be readily slipped off from this journal, the rest 21 being thus readily detachable from its support.

In actual use of this fracture device, its advantages over other methods of treatment of Colles fracture are immediately apparent. The patient is placed supine on an operating table, or any table to which the device may be fitted, and preparations are made for anesthesia. During this period the device is so placed that the patient's upper arm, when abducted to 90°, properly engages, with regard to height and angle, the padded upright portion of the frame. With the elbow clearing freely the outermost portion of the padded upright, the forearm rest is so adjusted both as to angle and distance from the main upright spindle that the forearm rests comfortably on the rough-shaped rest so that the wrist clears the outermost edge of the rest. The forearm thus lies parallel to the patient's body and is generally pointing slightly upward from the horizontal position. After these adjustments have been made, the patient is anesthetized.

With the upper arm resting snugly against the padded upright for counter traction, steady traction is then applied to the hand and wrist by the operator and the fracture is reduced. During this portion of the procedure the forearm usually is suspended over the horizontal forearm rest. When the manipulation has been completed, the forearm is then lowered upon this rest, and with traction still being maintained by the operator, the exact position of the hand and wrist is maintained, and anteroposterior and lateral X-rays may be taken.

When the position of the fragments is satisfactory to the surgeon, he then turns the maintenance of the traction over to an assistant who stands alongside the table and exerts gentle

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traction in a predetermined position by holding on to the patient's thumb with one hand and the patient's fingers with the other. No other assistance is necessary and the surgeon is then free to apply plaster, or whatever form of immobilization he may choose, to the extremity.

This may be applied directly to the extremity, including the rest 21 itself, back to the point where the latter receives its support from the small upright rod 19. This will take the immobilization well back to the elbow, which is ordinarily sufficient immobilization for a wrist fracture. The extremity is maintained in this position until the plaster or other immobilization has set. The forearm supporting rest is then detached from its supporting upright rod 19 by loosening the locking screw 23 and sliding the bracket 22 about 2 cm. laterally off the horizontal end portion of the rod. The rest is then detached from the immobilizing medium by simply withdrawing it from beneath the latter in the axis of the forearm. Should the operator wish to continue the immobilization of this fracture to a point above the elbow, he may then do so at this juncture.

The frame finds additional use in the treatment of both bones of the forearm by providing a means of counter traction against the padded upper arm rest 24. The forearm rest is of little use in this connection, and, under these circumstances, may be entirely detached if desired. After reduction of the fracture, traction and counter traction may be maintained while some form of immobilization could be applied.

The obvious advantages of this device herein shown in the treatment of wrist fractures are as follows:

1. A means of counter traction is provided at all times, which does not require the presence of an assistant.

2. Once the fracture has been reduced, provision is made for the maintenance of accurate reduction by the continued support of the forearm.

3. X-rays may be taken at the time of reduction with assurance that the position of the fragments following application of some means of immobilization will be maintained as of the completion of immobilization.

4. After reduction has been secured, the presence of one untrained assistant to hold the hand in a predetermined position leaves the surgeon completely free to apply the means of immobilization, knowing that the reduction will be maintained throughout this portion of the procedure.

Having thus disclosed my invention and described in detail an illustrative embodiment thereof, I claim as new and desire to secure by Letters Patent:

1. A fracture supporting device comprising a bracket having an opening for the reception of the rail of a hospital table, clamping means, an upright spindle rising from the bracket, a horizontally disposed forearm rest carried by the spindle and having a free end projecting into unobstructed space, an upper arm rest mounted on the spindle independently of the forearm rest and at a level above the latter and having a curved face directed away from the free end of the forearm rest, the mounting of the upper arm rest including a curved plate and a clamping bolt whereby the upper arm rest may be adjusted above the center of its radius of curvature to locate it for resisting traction applied to the forearm.

2. A fracture support comprising a main bracket adapted to be clamped to an operating table and having a vertical bore, a spindle adjustably mounted therein, a horizontal arm projecting from the spindle, a trough-shaped forearm rest adjustably mounted thereon and having a free end projecting into space, an upper arm rest mounted independently and adjustably on the spindle above the horizontal arm and presenting a substantially vertical concave face directed away from the free end of the forearm rest for resisting traction applied to the forearm.

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