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D. F. PINCOCK

2,434,431

SURGICAL PIN GUIDE

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Fig. 1.

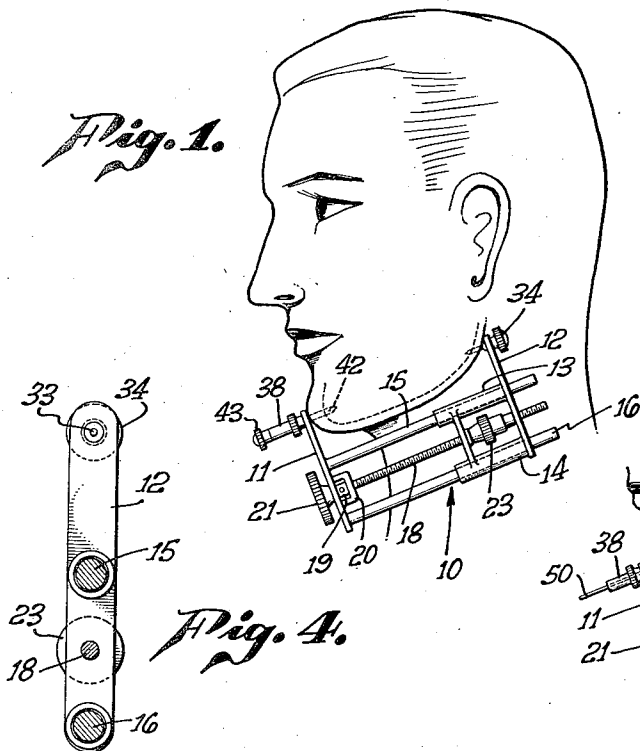


Fig. 6.

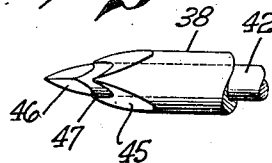


Fig. 2.

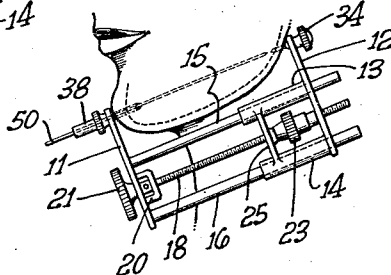


Fig. 4.

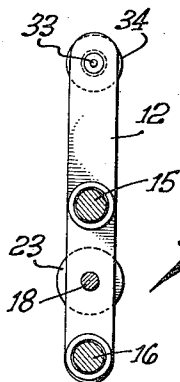


Fig. 3.

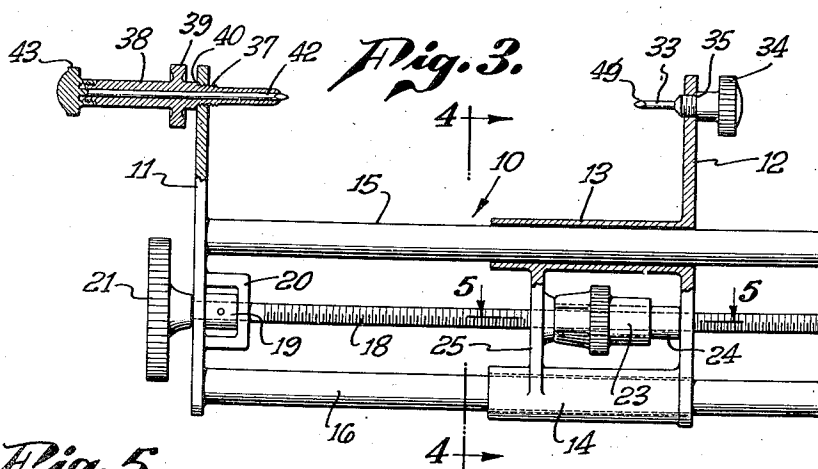
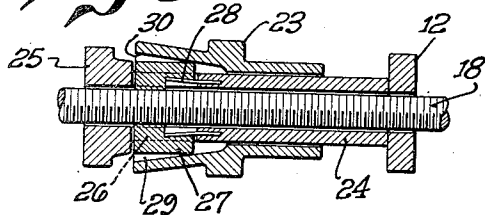


Fig. 5.



DOUGLAS F. PINCOCK,
INVENTOR.

BY

Russell R. Pinckney

ATTORNEY.

UNITED STATES PATENT OFFICE

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SURGICAL PIN GUIDE

Douglas F. Pincock, Santa Barbara, Calif., assignor of one-half to Jack R. Pava, Santa Barbara, Calif.

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4 Claims. (Cl. 128—92)

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The present invention relates to a device for inserting Kirschner wire or metallic pins through fractured bones. This appliance was particularly designed in the form shown for use in treating fractured mandible or jaw bones. However, the accurate drilling features of this device will be advantageous in the treatment of fractures of other bones.

There have been a number of different methods of treating fractures of the mandible but these are generally undesirable, either having the objection that they do not permit mandibular motion, making it difficult to eat and speak, and do not facilitate good oral hygiene. External appliance methods are unsightly and cleansing of the areas involved under the appliance is limited if not prevented.

It is an object of this invention to provide a simple and efficient device by which a Kirschner wire may be introduced through the body of the mandible across the fracture and both ends of the pin embedded in the cortical bone, the unused wire being cut short, the skin being raised over the end of the pin, leaving no external evidence of the fixating pin.

Other objects and advantages will appear hereinafter from the following specifications and drawings.

Referring to the drawings, which are for illustrative purposes only:

Fig. 1 is a side elevation of the device embodying a preferred form of my invention, showing the same located in position for performing the operation of inserting the Kirschner wire in the mandible;

Fig. 2 is a view similar to Fig. 1, illustrating the Kirschner wire in place;

Fig. 3 is an enlarged elevational view, partly in section, of the device shown in the preceding figures;

Fig. 4 is a cross sectional view on line 4—4, Fig. 3, looking in the direction of the arrows;

Fig. 5 is an enlarged sectional view showing a slip nut used on the feed screw; and

Fig. 6 is an enlarged view of the end of the director tube with director pin therein.

Referring more particularly to the drawings, the device consists generally of an adjustable frame indicated at 10. This frame consists of two arms 11 and 12, the arm 12 having guide tubes 13 and 14 extending inwardly therefrom in the direction of the arm 11, and the arm 11 being provided with two rods 15 and 16 extending inwardly therefrom and through the respective tubes 13 and 14 which act as guide tubes; this construc-

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tion just described forming what may be termed a telescoping frame. The relative position of the arms 11 and 12 is adjusted by means of a feed screw indicated at 18, mounted on the arm 11, such screw having a collar 19 pinned thereon, the collar being held against longitudinal movement by means of a bracket indicated at 20 formed as part of the arm 11. The unthreaded portion of the screw 18 extends freely through the arm 11 and is provided with a knurled head indicated at 21.

Means are provided for permitting free and quick adjustment of the arms 11 and 12 with respect to each other, that is, the arm 12 may slide freely on the rods 15 and 16 so that the two arms may be quickly adjusted to approximate position desired. However, for fine adjustment after the approximate position has been obtained, I have provided what may be termed a clamping nut 23. This nut is slideably mounted on a sleeve indicated at 24 mounted between the arm 12 and a rib 25 which extends between the guide tubes 13 and 14. This sleeve 24 freely receives the screw 18 and is slotted as indicated in dotted lines at 26 in Fig. 5 to receive dogs 27 which are threaded to engage the screw 18, the dogs being yieldingly held outwardly out of engagement with the screw 18 by means of flat springs indicated at 28, the inner ends of which are fixed in the sleeve 24. The interior of the nut 23 is recessed as indicated at 29 to receive the dogs 27 and the nut 23 is provided with cam faces indicated at 30 which engage the dogs 27, and when moved into the position shown in Fig. 5 bring the dogs into engagement with the screw so that fine adjustment can then be made with respect to the arms 11 and 12 by operation of the head 21. This clamping nut just described is of common form and is merely utilized in the present device for the purposes indicated.

The upper end of the arm 12 is provided with a threaded opening which receives a threaded centering pin indicated at 33, such pin having a thumb nut 34 at its outer end and a shoulder 35 which engages against the outer face of the arm 12.

The upper end of the arm 11 is provided with a threaded opening which receives the threaded portion 37 of a director tube indicated at 38, such director tube having a knurled head 39 for threading the tube in proper position in the arm. The tube has a shoulder 40 which engages against the outer face of the arm 11. 42 indicates a director pin provided at its outer end with a knurled head 43 for securing the pin 42 in the tube 38,

the head 43 being internally threaded at its inner end to engage the threaded outer end of the director tube 38. The inner end of the tube 38 is provided with a series of bevelled faces indicated at 45 and the inner end of the tube 42 is also provided with bevelled faces, forming a point indicated at 46 on the pin 42 and the bevelled face 45 of the tube 38 terminates in sharp points 47 which permit the entry of the point of the pin 33 and the pointed tube into the mandible as hereinafter described. The director pin 33 is also pointed at its inner end as indicated at 49 for the same purpose.

It is to be noted that the pins 33 and 42 are directly in a straight line, that is, the same longitudinal axis extends through both of these pins, the purpose of such arrangement appearing more fully hereinafter.

The instrument herein described is used in the following manner. The pin guide is applied by first inserting the point 49 of the centering pin 33 into the posterior border of the mandible. The point of the director pin 42 and the director tube 38 is introduced into the area lateral to the symphysis as illustrated in Fig. 1 of the drawings, the outline of the jaw bone being indicated in dotted lines. The head 21 of the feed screw 18 is then tightened as the pin guide is rotated on the axis of the centering pin and the director pin, that is, the instrument is raised and lowered about the axis of these pins and at the same time the pins are brought toward each other, drilling themselves into the cortical bone. After the pin guide is firmly clamped into position posterior-anterior and lateral jaw X-ray films are taken for checking the position of the pins. The director pin 42 is then screwed out of the director tube 38 and the Kirschner wire indicated in Fig. 2 at 59 is run through the director and drilled into position. Digital examination is then made to find the posterior end of the pin, but prior to this examination the clamping nut 23 is released and the arms of the instrument spread so that the instrument is removed from the patient. If, after the digital examination, the posterior end of the pin cannot be located, the drilling is continued a short distance only until the end of the pin can be felt just through the posterior border of the ramus. The exposed end of the Kirschner wire or pin 50 is then cut to permit pulling of the skin and subcutaneous tissue over it, leaving no external evidence of the pin.

From the above description it will be understood that the Kirschner wire or pin extends through the fractured part of the jaw and firmly holds the parts together. However, if additional support is needed, it may be necessary to insert another Kirschner wire in the same manner as above described although the instrument would be changed in its location to place the second wire angular with respect to the first wire. From experience in a great number of cases it has been found that the Kirschner wire can be removed in about six weeks merely by making a small stab incision and locating the end of the wire, the wire being grasped by a heavy plier and withdrawn with a rotative motion.

Although one form of the invention has been particularly shown and described, it is contemplated that various changes and modifications can be made without departing from the scope of the invention and it is intended to cover such changes and modifications as come within the scope of the claims.

I claim as my invention:

1. A surgical pin guide comprising: a pair of arms; telescopic means connecting said arms; a feed screw mounted on one of said arms cooperative engageable with the other arm for varying the position of the arms with respect to each other; a centering pin mounted in one arm; a director tube mounted on the other arm, and a removable director pin in said tube; said pins extending in the same longitudinal axis and having sharp inner end portions; and releasable means mounted on one of said arms for disengagement of said feed screw to permit free movement of the arms toward and from each other.

2. A device for applying a wire through a fractured bone, comprising a frame presenting a pair of spaced arms adapted to receive the bone therebetween, a wire-passing pin carried by one of the arms, a centering pin carried by the other arm in coaxial alinement with the wire-passing pin, and means for moving the pins axially towards each other, said pins having relatively sharp bone-piercing inner end portions whereby, in response to said movement, to pierce the bone at opposite sides of the fracture.

3. In a device for applying a wire through a fractured bone, a frame carrying a pair of spaced arms for adjustment towards and away from each other, and a guide pin carried by the outer end of one arm, a centering pin carried by the outer end of the other arm, said pins being disposed in coaxial alinement and having relatively sharp bone-piercing pointed inner ends whereby, in response to adjustment of the arms towards each other, to pierce a fractured bone at aligned points on opposite sides of the fracture.

4. In a device for applying a wire through a fractured bone, a frame carrying a pair of spaced arms for adjustment towards and away from each other, a tubular guide pin carried by one of the arms, an inner pin removably mounted axially in the tubular guide pin, said guide pin and inner pin having relatively sharp bone-piercing pointed inner ends, and a second guide pin mounted in the other arm in coaxial alinement with said first-mentioned guide pin and inner pin, said pins being movable towards each other in response to adjustment of the arms to pierce a fractured bone on opposite sides of the fracture.

DOUGLAS F. PINCOCK,

REFERENCES CITED

The following references are of record in the file of this patent:

FOREIGN PATENTS

Number	Country	Date
718,055	France	Jan. 19, 1932