

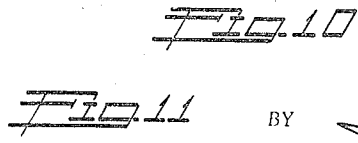
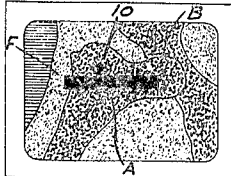
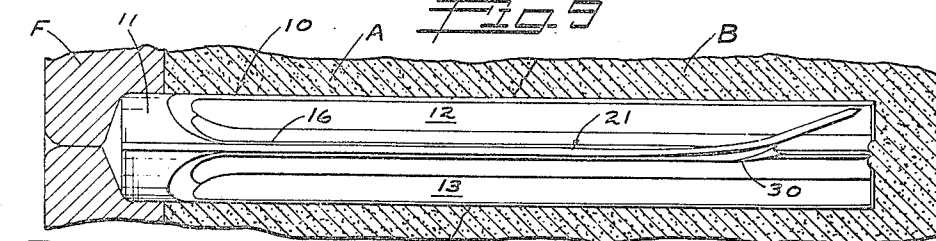
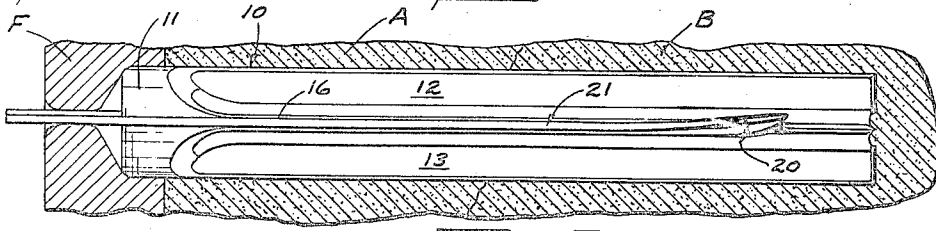
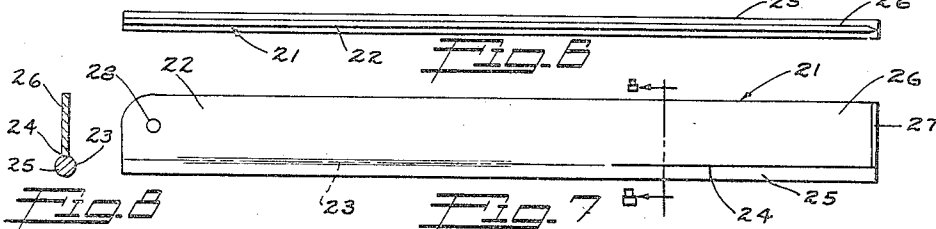
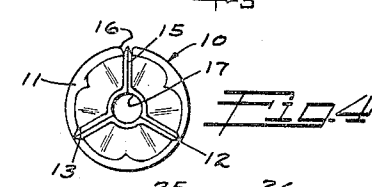
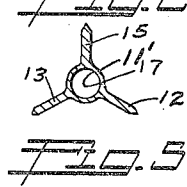
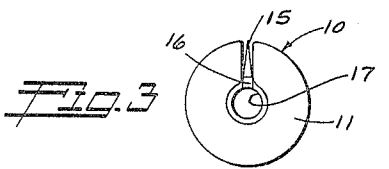
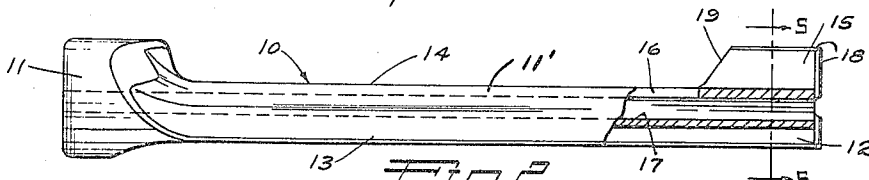
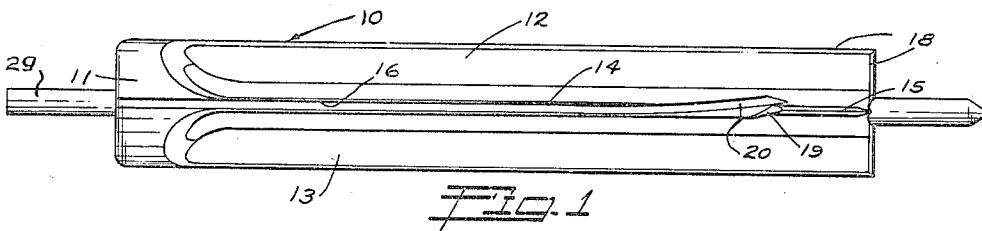
Aug. 24, 1943.

H. A. JOHNSTON

2,327,434

FRACTURE SECURING APPARATUS

Filed May 7, 1943



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FRACTURE SECURING APPARATUS

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9 Claims. (Cl. 128-92)

This invention relates to novel fracture securing apparatus and to a novel method for the fixation of fractures.

The general object of the invention is to provide a novel mechanical means for securing together fractured bones, particularly the neck of the femur.

Another object of the invention is to provide a novel method of securing together fractured bones.

Another object of the invention is to provide a novel method to retain a fracture securing member within a fractured bone.

An additional object of the invention is to provide a novel fracture nail including novel means to prevent movement of the nail when the latter is in place.

Other and further important objects of the invention will be apparent from the disclosures in the specification in the appended claims taken in connection with the accompanying drawing, wherein:

Fig. 1 is a top plan view of a nail embodying the features of my invention;

Fig. 2 is a side elevation of the nail;

Fig. 3 is a front view of the nail;

Fig. 4 is a rear view;

Fig. 5 is a sectional view taken on line 5-5, Fig. 2;

Fig. 6 is a top plan view of the key;

Fig. 7 is a side elevation of the key;

Fig. 8 is a sectional view taken on line 8-8, Fig. 7;

Fig. 9 is a section through a portion of a fractured bone and adjoining flesh and shows the hip bone securing means in position with the key partially inserted;

Fig. 10 is a view similar to Fig. 9 showing the key fully inserted, and

Fig. 11 is an illustration of an X-ray film showing the fracture securing apparatus in position to fix a fracture of the hip bone.

Referring to the drawing by reference characters I have shown my invention as embodied in a securing device which is indicated generally at 10. As shown, the device includes a cylindrical head portion 11 from which a body portion 11' extends. The body portion 11' has a pair of downwardly and outwardly directed ribs 12 and 13. The intermediate portion of the body includes a notch 14 and at its front end the body has a short rib 15 similar to the ribs 12 and 13.

Beginning at and extending through the head and along the body I provide a slot 16. This slot 16 intersects a cylindrical axial bore 17, which ex-

tends throughout the length of the body. The forward end of the slot 16 passes to one side of the inner end of the short rib 15. The ribs or flanges 12, 13 and 15 are sharpened at the edges and outer ends as at 18 to facilitate easy entrance of the device into a bone and the inner end of the rib 15 may be bevelled as at 19 to facilitate withdrawal if desired. At its inner end the slot deviates to one side, as shown at 20.

Referring now to Fig. 6, I show a key which is indicated generally at 21. The key includes a substantially flat body portion 22 the lower edge of which has a bulbous head 23 (see Fig. 8). One end of the key 21 has a shear line 24 which extends inwardly some distance to form a bead or rod 25 and a tongue 26 which is sharpened as at 27. To facilitate removal of the key 21 from the apparatus I provide a hole 28 through which a wire or other means may be inserted to aid in the withdrawal.

My device is particularly adapted for use in securing a fractured hip bone and is preferably employed in the following manner.

The position which the securing member is to assume will be determined by X-ray or other means and the location for the point of insertion suitably determined and indicated. The patient is preferably arranged so that the securing member will enter horizontally.

I may employ the rod inserting member shown in my prior patent, 2,267,925, granted December 30, 1941. In practice a small puncture is made and thereafter a rod 29 is inserted. After the rod is in place and its location has been determined by X-ray, if desired, the securing member is mounted so that the bore 17 thereof receives the rod and the securing member is then forced into place as by means of a mallet. When the securing member has been moved to the position desired the rod 29 is removed and the key 21 is arranged so that the bead 25 enters the bore 17. A mallet is then employed to drive the key into place and the key advances until the end 27 thereof enters the deflecting portion 20 whereupon the advancing end of the key deviates laterally so that it assumes the position shown in Fig. 10. In this condition the key flange in deviating to one side provides a grip on the head of the bone and stabilizes the securing member and fixes it more or less to the head so that it will not easily become dislodged or removed from the head of the bone either outwardly or inwardly.

With certain previous types of bone securing devices should absorption of the neck of the bone in the region of the fracture remove any consid-

erable part of the bone thus causing a shortening of the neck, the friction which is always greatest at the outer end of the securing member holds that end fast, permitting the other end to be pushed on through the head into the pelvis. Accidents of this nature have frequently occurred and it is one of the objects of my invention to overcome this difficulty.

My improved construction prevents the securing member from falling out which has happened in some instances with the old type securing members. With my construction if the securing member becomes loosened at any time it will remain anchored in the head of the bone.

From the foregoing description it will be apparent that I have invented a novel securing member which can be economically manufactured and which is highly efficient for its intended purpose.

Having thus described my invention, I claim:

1. A fracture securing device comprising an elongated body having a bore and having a rib extending from the body, said body having a slot therein communicating with the bore, and a key member having a bead slidably fitting said bore, said key including an end portion bent at an angle to the remainder of the key.

2. A fracture securing device comprising an elongated body having a bore and having a rib extending from the body, said body having a slot therein communicating with the bore, and a key member having a bead slidably fitting said bore, said key including a blade extending outwardly therefrom and projecting through said slot, and means on said body for bending said key.

3. A fracture securing device comprising an elongated body having a bore and having sharpened ribs extending from the body, said body having a slot therein communicating with the bore, said body having a short rib portion at the forward end, and a key member having a bead slidably fitting said bore, said key including a blade extending outwardly therefrom and projecting through said slot, said key having a tongue at the front end, said slot having a laterally directed portion engageable by the tongue when the latter is moved forwardly and being adapted to bend the tongue outwardly.

4. A fracture securing device comprising an elongated body having a bore and having a sharpened rib extending from the body, said body having a slot therein communicating with the bore, said body having a bevelled portion at the forward end of said slot, and a key member having a bead slidably fitting said bore, said key including a blade extending outwardly therefrom and projecting through said slot, said key having a portion at the front end engageable with said bevelled portion.

5. A fracture securing device comprising an elongated body having a central bore and having diverging sharpened ribs extending from the body, said body having a slot therein communicating with the bore, said body having a short radial rib portion at the forward end, the forward end of said slot extending laterally, and a key member having a bead slidably fitting said bore, said key including a blade integral with the bead and extending outwardly therefrom and projecting through said slot, said key having a sharpened front end, the forward end of said slot being engageable by the key when the latter is moved forwardly and being adapted to bend the front end of the key outwardly.

6. A fracture securing device comprising an elongated body having a central bore and having diverging sharpened ribs extending radially from the body, said body having a radial slot therein communicating with the bore, said slot having a bevelled portion at the forward end, and a key member having a cylindrical bead slidably fitting said bore, said key including a blade integral with the bead and extending outwardly therefrom and projecting through said slot, said key having a sharpened front end and having a hole at the rear end thereof, said bevelled slot end being engageable by the key when the latter is moved forwardly and being adapted to bend the front end of the key outwardly.

7. For use in a fracture securing device, a key member having a cylindrical bead, said key including a blade integral with the bead and extending outwardly therefrom, said key having a sharpened tongue at the front end, said tongue including a forwardly projecting portion free from said bead.

8. For use in a fracture securing device, an elongated body having a central bore and having diverging sharpened ribs extending radially from the body, said body having a radial slot therein communicating with the bore, said slot having a bevelled portion at the forward end thereof.

9. The method of securing a fracture, comprising aligning the fractured portions of a bone, advancing a rod through the fractured portions of the bone, arranging a slotted ribbed member having a bore on the rod and moving the ribbed member along the rod and into the bone portions which are to be secured, thereafter removing the rod and inserting a key in the bore and slot, the key including a portion extending outwardly through the slot, and moving the key forwardly and simultaneously deflecting the forward end of the key to cause it to form a lock to prevent axial movement of the member.

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