

Jan. 17, 1939.

G. M. MORRISON

2,144,342

BONE DRILL DEVICE

Filed Aug. 18, 1937

FIG-1-

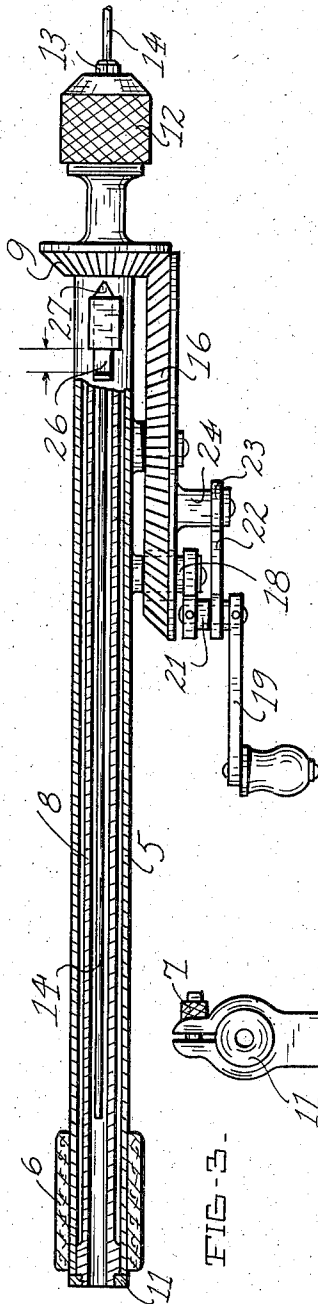


FIG-3-

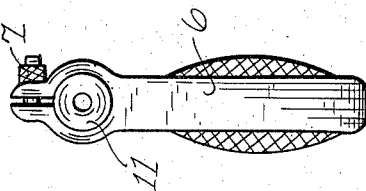
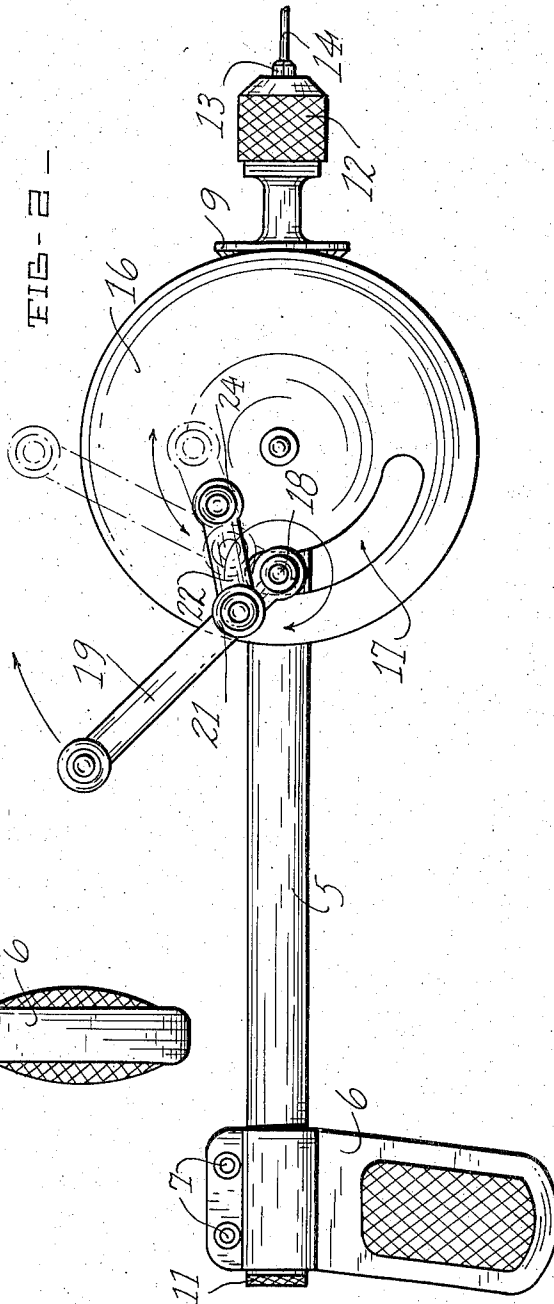


FIG-2-



INVENTOR.
GORDON MORRISON
BY *G. H. Drew*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,144,342

BONE DRILL DEVICE

Gordon M. Morrison, San Mateo, Calif.

Application August 18, 1937, Serial No. 159,622

2 Claims. (Cl. 128—83)

This invention relates to improvements in surgical apparatus, and has particular reference to a device for inserting wires into bones.

The principal object of the invention is to produce a device which will drill through the bone inserting the wire therethrough, and a device which will not cause the soft tissues of flesh to wind around the wire drill.

A further object of the invention is to produce a device of this character which will house the wire and support the same during the drilling operation.

A further object of the invention is to produce a device of this character which may be readily used in either the right or left hand.

A further object of the invention is to produce a device of this character which is economical to manufacture, and a device which is easy to sterilize.

A further object of the invention is to provide means for quickly releasing and re-engaging the wire being drilled into the bone.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawing forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a top plan view of my device, having a portion thereof broken away in order to better illustrate the mechanism thereof;

Fig. 2 is a side elevation of Fig. 1; and

Fig. 3 is a rear elevation of the handle per se.

In repairing fractures of the bone, it is common to employ wires or pins which extend through the bone, and in order to insert these wires or pins into the bone it is common to sharpen the end of the wire, to then hold it in a suitable tool and rotate, in order that the sharpened end of the wire will act as a drill bit, and after pressing through the flesh will engage the bone and pass therethrough. Due to the rotary motion of the drilling element (wire or pin) considerable difficulty is experienced, by the soft tissues of the body, particularly fibrous sinews, wrapping themselves about the rotating wire and doing considerable damage.

Applicant has, therefore, devised a drilling mechanism for surgical use, wherein the wire or pin is given reciprocating motion, whereby any tendency of the fibers to wind around the drill is offset by the back and forth motion.

In the accompanying drawing wherein for the purpose of illustration is shown a preferred em-

bodiment of my invention, the numeral 5 designates a tubular member to which is secured a hand grip 6 through the medium of clamping screws 7. Within this tubular member is a hollow spindle 8, having a gear 9 secured thereto and abutting one end of the tubular member and having a thrust bearing 11 abutting the opposite end of the tubular member. This spindle carries at its free end a chuck 12, having jaws 13 capable of engaging a wire 14, the major portion of which wire is housed within the hollow spindle at the start of the operation. A gear 16 meshes with the gear 9, and has an arcuate slot 17 formed therein to accommodate a stud 18 about which the handle 19 slides. The handle 19 has an offset 21 which is engaged by one end of a connecting link 22, the opposite end of which is pivoted, as at 23, to a stud 24, mounted upon the gear 16. A detent 26 is slidably secured upon the tubular member 5, and has a point 27 which may be moved into engagement with the teeth of the gear 9 for the purpose of locking the rotation of this gear and its attached parts.

It will be apparent from the above, that when a wire 14 having a sharpened end is placed in the jaws of the chuck, this wire may be placed into the hollow spindle leaving protruding from the chuck only a sufficient length of wire to serve immediate needs.

Assuming now that the wire is being inserted in a bone, the operator will hold the hand grip 6 in the left hand (if the operator is right handed), then, by rotating the handle 19 with the right hand, reciprocating motion will be given to the gear 16 through the link connection 22. This reciprocating motion will in turn be transmitted to the gear 9, the spindle 8, the chuck 12 and the wire 14. After the wire has been drilled into the bone a sufficient distance, so that the chuck comes against the flesh, then the detent 26 is moved from the position of Fig. 1, so that the point 27 engages the teeth of the gear 9 and locks the same against further rotation. The operator now releases the chuck 12 moves it backward on the wire 14, or in other words, away from the patient, regrips the wire, releases the detent and proceeds with the drilling operation. Should the operator be left handed, the hand grasp 6 may be rotated by loosening the clamping screws 7.

It will thus be apparent that my device will readily accomplish all of the objects above set forth.

It is to be understood that the form of my invention herewith shown and described is to be

taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. In a device of the character described, a tubular member, a handle adjustably secured to said tubular member, a hollow spindle rotatably mounted in said tubular member, a gear secured to said spindle, a chuck secured to said spindle in such a manner that a wire may be passed through said chuck into said hollow spindle, a gear carried on said tubular member and meshing with said first mentioned gear, means for reciprocating said last mentioned gear, said means including a handle rotatably mounted on said tubular member and having an offset formed therein, said offset being connected to said gear through a pivoted link.

2. In a device of the character described, a tubular member having a handle adjustably lengthwise thereof, a hollow spindle rotatably positioned in said tubular member, a chuck secured to said spindle, said chuck being hollow, whereby a wire positioned therein may extend into and through said spindle, a gear carried by said spindle, a second gear mounted on said tubular member and meshing with said first-mentioned gear, said last-mentioned gear having an arcuate shaped opening extending there-through, a crank handle having pivotal connection with said tubular member, said pivotal connection extending through said arcuate shaped opening in said gear, and a pivoted link connecting said crank handle and said last-mentioned gear, whereby rotation of said handle will cause a reciprocating action of said gear.

GORDON M. MORRISON. 20