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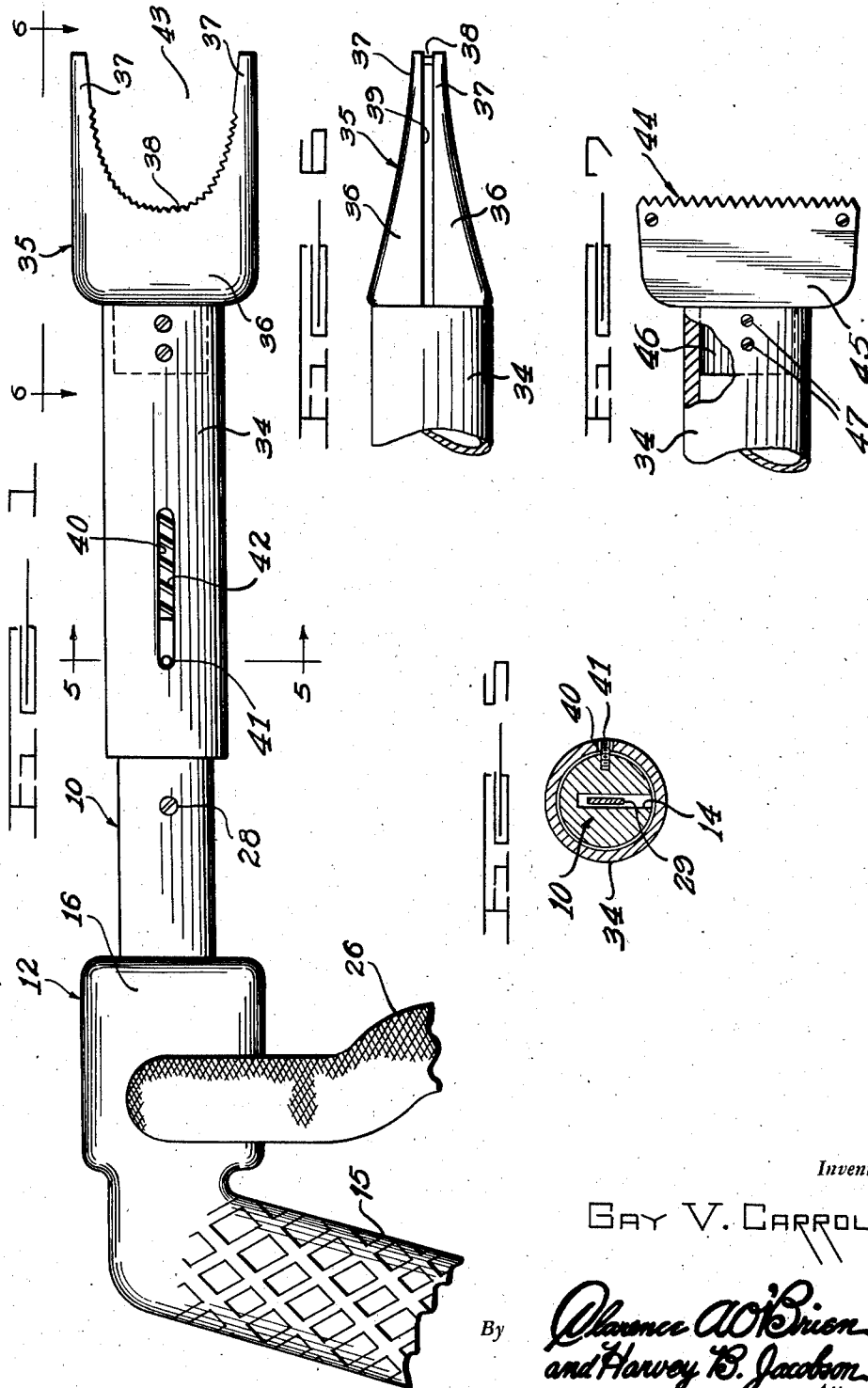
G. V. CARROLL

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BONE SAW

Filed Nov. 1, 1946

2 Sheets-Sheet 1



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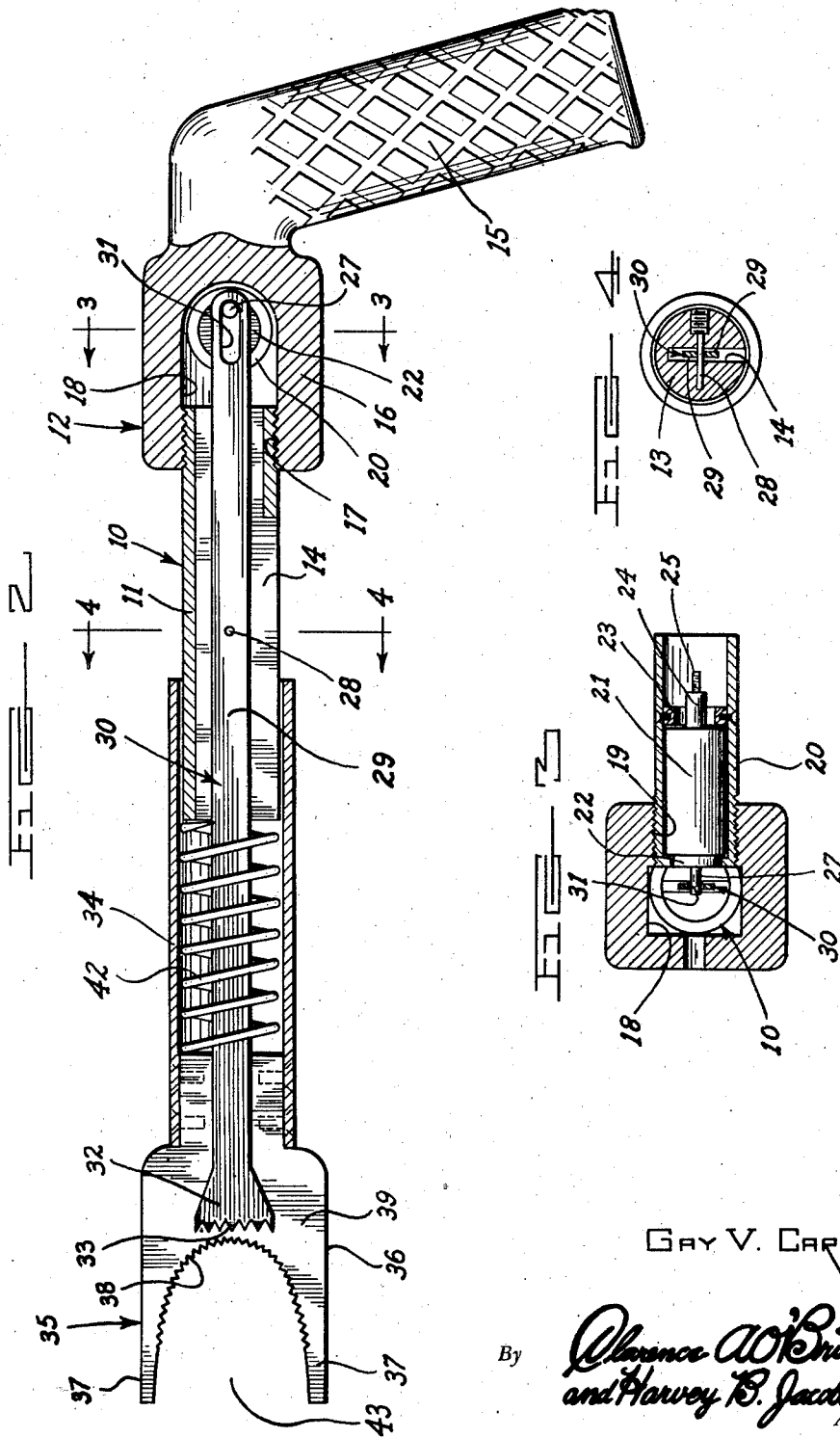
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UNITED STATES PATENT OFFICE

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BONE SAW

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2 Claims. (Cl. 128—317)

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This invention relates to a surgical instrument, and more particularly to a bone saw.

The primary object of the invention is to facilitate the performing of a surgical operation in which it is desired to sever a bone.

Another object is to enable a surgeon to perform an incision in a bone to the desired depth, or to completely sever the bone according to the requirements of the case.

Still another object of the invention is to steady the object to be operated upon during the sawing operation.

The above and other objects may be attained by employing this invention which embodies among its features a saw guard having spaced arms adapted partially to embrace and steady an object to be operated upon, a power driven saw mounted to move transversely of the saw guard in a plane perpendicular to the axis of an object embraced and steadied by the arms, and means to move the saw toward an embraced object along an axis which lies parallel with the longitudinal axes of the arms.

Other features include means yieldingly to retract the saw from the embraced object, a crank disc for moving the saw and a flexible cable establishing driving connection between the crank disc and a prime mover by which power may be transmitted for the operation of the saw.

In the drawings,

Figure 1 is a side view of a bone saw embodying the features of this invention,

Figure 2 is a longitudinal sectional view through the saw illustrated in Figure 1,

Figure 3 is a transverse sectional view taken substantially along the line 3—3 of Figure 2,

Figure 4 is a transverse sectional view taken substantially along the line 4—4 of Figure 2,

Figure 5 is a transverse sectional view taken substantially along the line 5—5 of Figure 1,

Figure 6 is a fragmentary plan view taken substantially along the line 6—6 of Figure 1, and

Figure 7 is a side view of a modified form of saw guard.

Referring to the drawings in detail a frame designated generally 10 is provided and comprises a tubular shell 11 provided at one end with screw threads to which a handle designated generally 12 is adapted to be attached. The tubular body 11 is provided with a filler member 13 (Fig. 4) which is provided with a longitudinally extending slot 14 in which the saw blade to be more fully hereinafter described operates. The handle member 12 is provided with a pistol grip 15 terminating at its upper end in a head

16 provided with an internally screw threaded socket 17 for engagement with the threads of the frame 10, and this socket opens at its inner end into a chamber 18 in which the saw driving mechanism is mounted. Opening through one side of the frame 12 is an internally screw threaded opening 19 which communicates with the chamber 18 and is adapted to receive an externally screw threaded nipple 20 in which is rotatably mounted a barrel 21 carrying at one end a crank disc 22 which rotates in a plane with one side of the chamber 18. The opposite end of the barrel is held in place in the sleeve 20 by means of a stop collar 23, and is provided with an axial boss 24 terminating in a squared portion 25 for connection with a conventional coupling to which the drive element of a flexible shaft 26 is connected. The opposite end of the flexible shaft 26 is connected with a prime mover (not shown) such as an electric motor, so that when the prime mover is set into operation the barrel 21 and crank disc 22 will be rotated within the nipple 20. A crank pin 27 projects from one face of the crank disc 22 and operates in the chamber 18 in an orbital path as will be readily understood upon reference to Figure 2.

Pivotaly mounted in the frame 10 substantially midway between opposite ends as at 28 is the shank 29 of a saw designated generally 30, one end of this shank extends into the chamber 18 and is provided with an elongated slot 31 in which the crank pin 27 is received, so that when the disc 22 is rotated the saw 30 will be oscillated about the pivot 28. The end of the shank 29 of the saw 30 opposite that containing the slot 31 is provided with a head 32 carrying across its end a row of saw teeth 33.

Telescopically associated with the frame 10, and slidably mounted over the end opposite that carrying the handle 12 is a sleeve 34 carrying at the end opposite the one which telescopes on the frame 10 a saw guard designated generally 35. This saw guard comprises a pair of longitudinally spaced heads 36 each provided with spaced longitudinally extending arms 37 the inner edges of which are generally arcuate configuration, and serrated as at 38 effectively to grip the object being operated upon. The ends of the arms 37 are joined by pins 38' which serves to hold the arms in spaced parallel relation at their outer ends in order to provide a clearance space 39 in which the head 32 of the saw 30 moves.

The sleeve 34 is provided with a longitudinally extending slot 40, and entering the frame 10 radially near its forward end is a stop pin 41 which

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serves to limit the longitudinal sliding movement of the sleeve 34 on the frame 10. A compression coil spring 42 surrounds the shank 29 of the saw 30 between the inner ends of the frame 10 and the head 35 so as yieldingly to urge the head away from the frame and retract the saw beyond the innermost confines of the work gap 43 formed between opposite pairs of arms 37.

In the modified form of the invention illustrated in Figure 7, a saw guard designated generally 44 comprises a pair of longitudinally spaced heads 45 each of which is provided with a substantially semi-circular boss 46 for entrance into the end of the sleeve 34 opposite that which receives the tubular body 11. These bosses are detachably secured in the tubular body by diametrically opposed screws 47 so that the heads may be held in spaced parallel relation to form a slot in which the toothed edge of the saw works. Formed along the ends of the heads 45 opposite those carrying the bosses 46 are serrations 48 for contact with a bone to be operated upon.

In use, it will be understood that the instrument is placed over the bone to be severed with the bone entering the work gap 43 and the serrations 38 bearing on the bone. The saw is then set into operation by driving the disc 22 and upon grasping the pistol grip 15 and exerting pressure against the bone, the spring 42 will be compressed to cause the teeth 23 of the saw head 32 to engage the bone. In this manner, the depth of cut may easily be regulated through the release and application of pressure against the pistol grip 15, and where conditions require, the bone may be sawed in two in a plane perpendicular to its longitudinal axis. It is to be noted that the head 35 engages the bone on both sides of the saw blade so that the pressure on both sides of the cut being made is equal at all times and consequently any splintering will be avoided. Obviously, the saw guard 44 may be substituted for the saw guard 35 and with this type of saw guard longitudinal or diagonal cuts may be made should occasion require, it being understood that the depth of cut may be regulated according to the pressure on the pistol grip.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combina-

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tion and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

I claim:

1. A surgical instrument comprising an elongated frame, a pistol grip at one end of the frame, a saw pivoted in the frame to swing in a plane lying along the longitudinal axis of the frame, a saw guard telescopically enclosing the frame at the end opposite the pistol grip, spaced arms extending longitudinally from the saw guard, said arms being adapted partially to embrace and steady an object to be operated upon, said saw guard having a longitudinal saw receiving slot which extends through the arms, means within the saw guard yieldingly to hold the saw retracted into the slot, and means to oscillate the saw about its pivot.

2. A surgical instrument comprising an elongated frame, a pistol grip at one end of the frame, a saw pivoted in the frame to swing in a plane lying along the longitudinal axis of the frame, a saw guard telescopically enclosing the frame at the end opposite the pistol grip, spaced arms extending longitudinally from the saw guard, said arms being adapted partially to embrace and steady an object to be operated upon, said saw guard having a longitudinal saw receiving slot which extends through the arms, means within the saw guard yieldingly to hold the saw retracted into the slot, a crank disc mounted in the frame to rotate about an axis lying perpendicular to the longitudinal axis of the frame, and a crank pin carried by the crank disc and engaging the saw to cause the saw to oscillate when the crank disc is rotated.

GAY V. CARROLL.

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