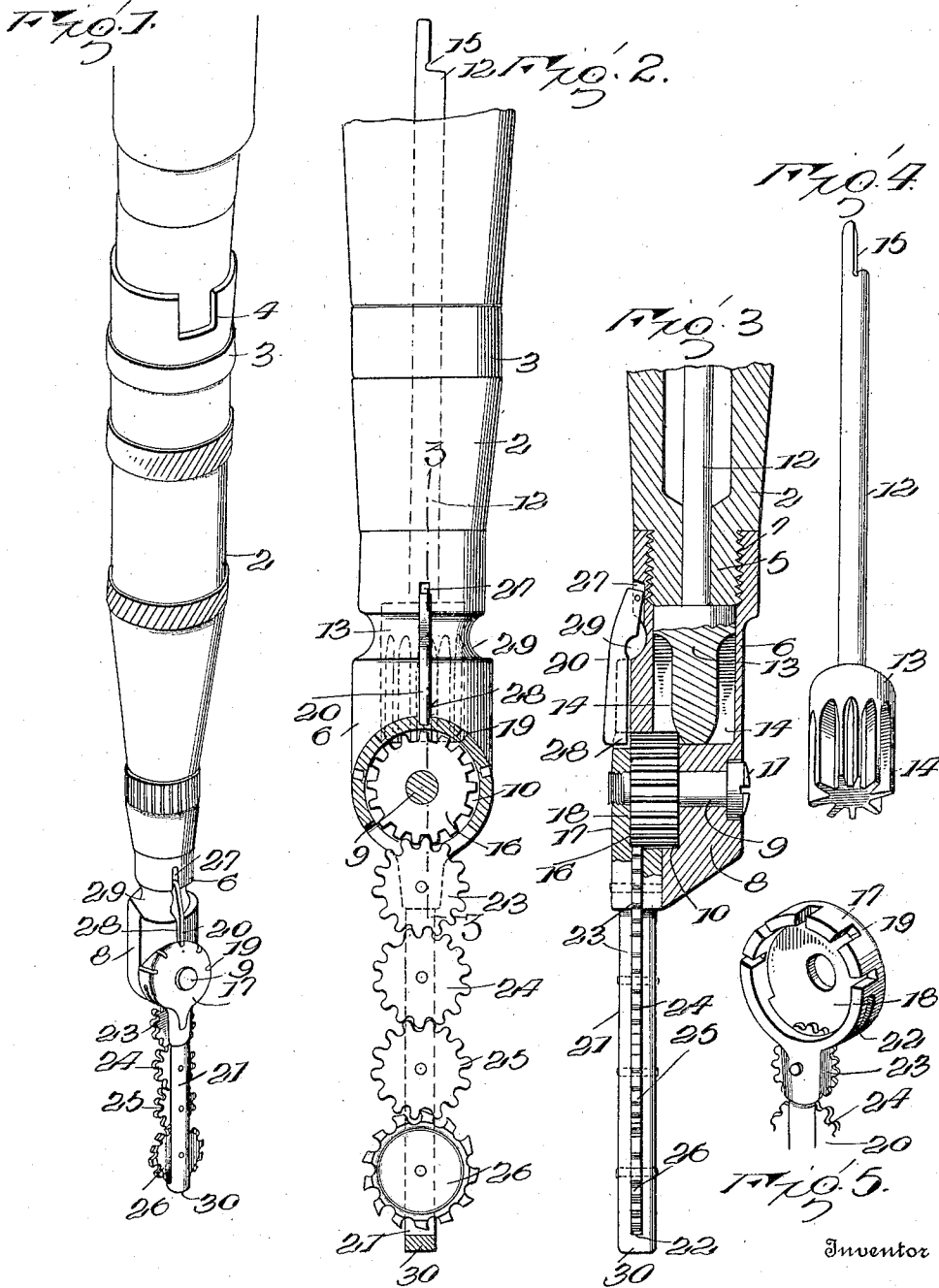


E. J. GREENFIELD,
SURGICAL SAW.
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1,179,910.

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Witnesses
E. O. Crocker
W. H. Woodson.

Inventor
E. J. Greenfield

By

H. A. Mearns, Attorneys.

UNITED STATES PATENT OFFICE.

EDWIN J. GREENFIELD, OF WICHITA, KANSAS.

SURGICAL SAW.

1,179,910.

Specification of Letters Patent.

Patented Apr. 18, 1916.

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To all whom it may concern:

Be it known that I, EDWIN J. GREENFIELD, citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Surgical Saws, of which the following is a specification.

This invention has as its object to provide a hand instrument in the nature of a rotary saw especially designed for use in making incisions or, more specifically, relatively narrow and deep recesses in the bone and the like.

It is one aim of the invention to so construct the instrument that an incision of practically any desired depth may be made without in any way interfering with the operation of the instrument.

Another aim of the invention is to so construct the instrument that the same may be accurately centered and guided when in use.

My invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a perspective view of my improved implement attached to the hand piece of an ordinary dental engine. Fig. 2 is an enlarged face view of the implement partly in section. Fig. 3 is a fragmentary section upon the line 3—3 of Fig. 2. Fig. 4 is a perspective view of the driving shaft and its attached tooth gear. Fig. 5 is a perspective detail view showing the upper end of the shank and the hollow socket formed therein.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Referring to these drawings, 2 designates a hollow or tubular sleeve formed upon its exterior with knurled bands 3, whereby it may be conveniently retained. This sleeve tapers toward its lower end and at its upper end is notched or recessed, as at 4, for engagement with the hand piece of a dental engine.

The lower end of the sleeve terminates in a screw threaded stud 5 and engageable with this stud is a ferrule 6 which forms a gear housing and a support for the train of gears, whereby power is transmitted to the saw. The ferrule 6 is hollow and at one end is interiorly screw threaded, as at 7, for engagement with the stud 5. The opposite end of the ferrule is solid, as at 8, and is transversely bored to receive a screw shaft

9. A socket 10 is formed at one face of this solid portion 8, a shaft 9 projecting into this socket. The shaft 9 is screw threaded at one end and at its opposite end is formed with a head 11 which is accommodated in a countersink formed in one face of the solid portion 8 of the ferrule.

Disposed within the hollow ferrule and within the bore of the sleeve 2 is a gear and gear shaft, illustrated in Fig. 4. The shaft 12 is formed at its lower end with an integral head 13 in which are formed longitudinally extending gear teeth 14. The head 13 with its gear teeth forms practically a crown gear. The upper end of the shaft 12 is notched and reduced, as at 15, to engage with the shaft of a dental engine or like driving apparatus.

A gear wheel 16 is disposed upon the screw shaft 9 and in the socket 10. This socket has an opening in its upper end through which the inner margin of the periphery of the gear wheel 16 extends, the teeth on the gear wheel 16 meshing with the teeth 14 on the head 13, so that the gear wheel 16 will be rotated by a rotation of the shaft 12. Also disposed against the flat face of the solid portion 8, so as to close the recess 10 therein, is a head 17. This head is circular and on its inside face is formed with a socket 18 which receives the outer end of the gear wheel 16. The periphery of the head is notched, as at 19, to receive a detent 20, as will be later stated. A shank 21 extends downward from this head, this shank being slotted for nearly its whole extent. Mounted within this slot 22 are a plurality of gear wheels 23, 24 and 25, forming a train of transmission gears. The gear 23 meshes with the gear wheel 16 mounted in the lower end of the slot 22, and meshing with the gear wheel 25 is a circular saw 26. The teeth of this saw mesh with the teeth of the gear wheel 25, and it will be understood, of course, that the teeth on the saw 26 are cutting teeth. It will now be obvious that the rotation of the shaft 12 will cause the rotation of the gear wheel 16, and this, in turn, will cause rotation of any of the gears 23, 24 and 25 and rotate the saw 26. The lower extremity of the shank 21 is rounded, so as to fit into a socket, preferably made for it in the bone on which the implement is used. For the purpose of adjusting the shank 21 into any desired angular relation to the axis of the sleeve 2 and hand piece of the

dental engine, I have provided the head 17 with notches 19, previously referred to, and provided the detent 20 which is pivoted at its upper end in the slot 27 formed upon the exterior of the ferrule 6. The lower portion of the gear wheel 16, and this, in turn, also formed in the ferrule and the detent crosses an annular reduced neck 29 formed in the ferrule, whereby the detent 20 may be raised from its engagement with a notch 19 to permit the shank and head 17 to be rotated to any desired angular relation, after which the detent may again be dropped into the proper notch 19 to thus hold the shank in its angularly adjusted position.

In the use of the instrument a relatively shallow recess of a diameter to substantially exactly receive the lower end 30 of the shank of the instrument is bored by any suitable tool in the surface of the bone or the like in which the incision or incisions are to be made. The said lower end of the shank is then inserted in this recess and the motor for operating the instrument is set in motion. As the rotary saw rotates and the incision is formed, the instrument is fed down into the bone until the incision is of the desired depth. It will be apparent that after one incision has been made transecting the

recess initially formed in the bone, the instrument may be withdrawn and disposed at an angle to the line of extent of the first incision and a second incision may be made in the same manner as above described.

Having thus described my invention, what is claimed as new is:

1. In an instrument of the class described, a shank of uniform diameter provided with a slot inwardly of its entering end, and a rotary saw blade mounted in the slot in the said shank.

2. In an instrument of the class described, a slotted shank of uniform diameter, the slot in the shank terminating short of the entering end thereof, a rotary saw blade mounted in the slot in the shank, and a gear for driving the saw blade also mounted in the slot in the shank, the said gear being located in the plane of the saw blade and being of a diameter and thickness not greater than that of the said blade.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN J. GREENFIELD. [L. s.]

Witnesses:

JULIA C. WILSON,
ANGIE DAVIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."