May 9, 1933. M. G. WELCH ET AL 1,908,201

BIPOLAR TONSIL FORCEPS

Filed March 9, 1931

Fig. 1.

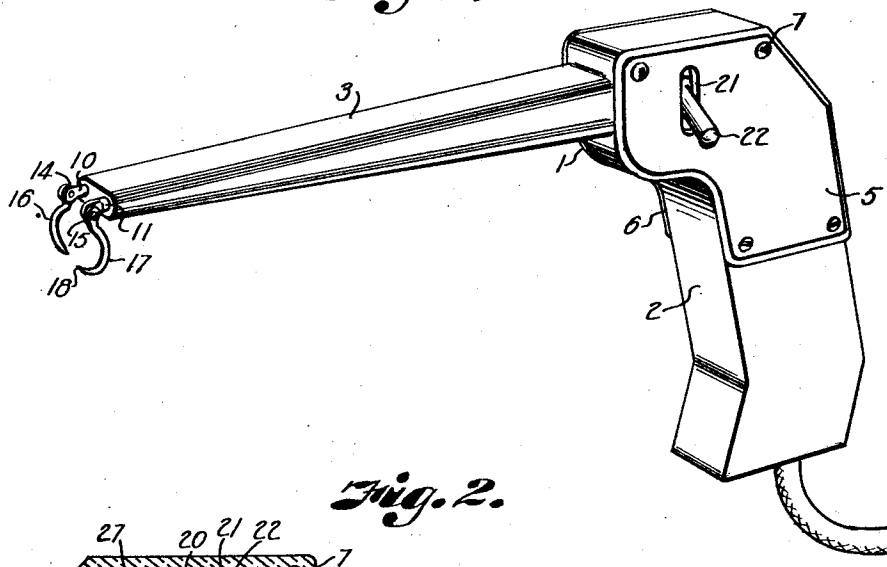


Fig. 2.

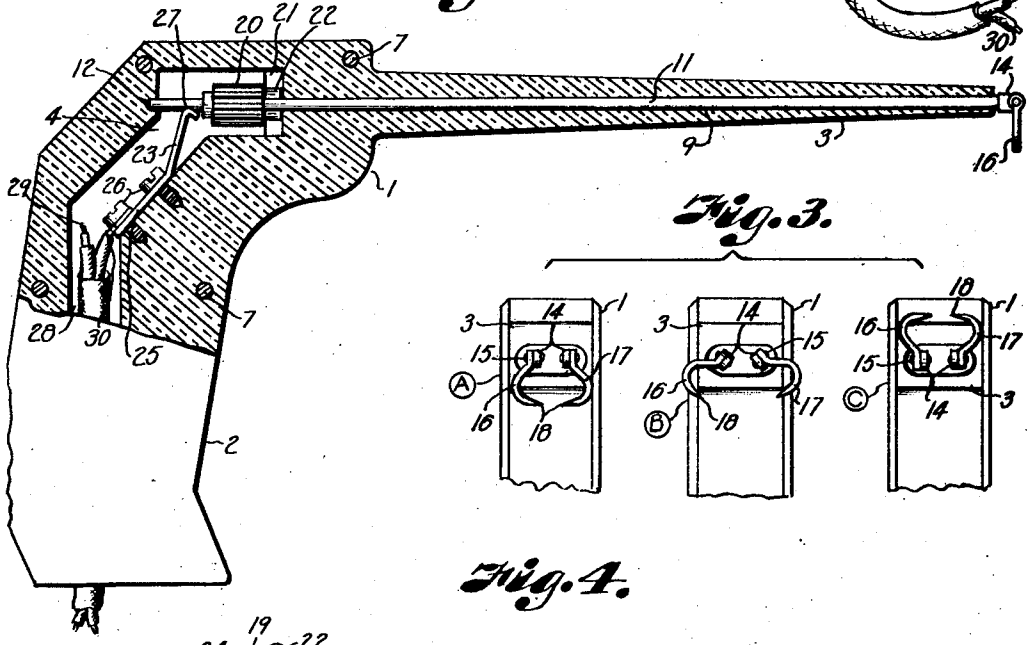


Fig. 3.

Fig. 4.

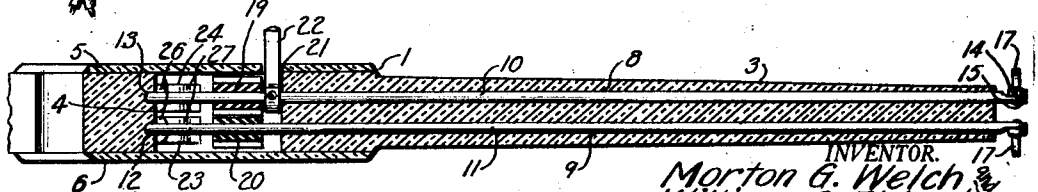
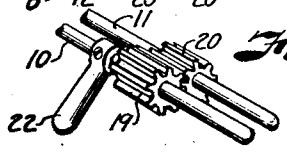


Fig. 5.



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UNITED STATES PATENT OFFICE

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BIPOLAR TONSIL FORCEPS

Application filed March 9, 1931. Serial No. 521,066.

This invention relates to a method of and an instrument for administering diathermic current in the coagulation of tissue being removed in diathermic operations, the principal objects of the invention being to perform such operations with a minimum of risk and inconvenience to the patient and with a lesser degree of professional hazard to the operator.

It is also an object of the invention to provide an instrument whereby the operator may control the depth of coagulation in the tissues.

In accomplishing these and other objects of the invention, we have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing wherein:

Fig. 1 is a perspective view of a diathermic instrument constructed in accordance with our invention.

Fig. 2 is a longitudinal sectional view through the instrument, illustrating the electrode shafts and their connection with the conductors for supplying the coagulating current.

Fig. 3 is a series of end view illustrating various positions of the forceps tips.

Fig. 4 is a longitudinal sectional view of the instrument taken at right angles to the section illustrated in Fig. 2, illustrating the electrode shafts and their actuating mechanism.

Fig. 5 is a detail perspective view of portions of the electrode shafts, particularly illustrating the inter-meshing gears and thumb lever for rotating the shafts.

Referring more in detail to the drawing:

The instrument here illustrated is particularly designed for the diathermy removal of tonsils and includes a substantially pistol shaped housing 1, preferably formed of a suitable insulating material and having a grip portion 2 and a barrel portion 3. The grip portion of the housing is provided with a recess 4 for the reception of the operating mechanism of the instrument and for the spring terminals which are employed in connecting the circuit wires with the operating shafts as later described.

The recess 4 extends laterally through the grip portion of the instrument and is closed by plates 5 and 6 attached to the sides of the housing by suitable fastening devices such as screws 7.

Extending longitudinally of the barrel in horizontally spaced relation is a pair of bores 8 and 9 for receiving a pair of electrode shafts 10 and 11. The electrode shafts preferably comprise cylindrical metallic rods of sufficient length so that their outer ends project from the outer end of the barrel and their inner ends extend across the recess 4 and into bearing sockets 12 and 13 formed in the wall of the recess as best illustrated in Fig. 4.

The outer ends of the rods are preferably flattened to form ears 14 having suitable apertures to receive pivot pins 15 for pivotally mounting the forceps tips 16 and 17 on the ends of the respective rods, whereby the tips may be swung from the positions shown at (*a*) and (*b*) to the position shown at (*c*), Fig. 3, so that the device may be adjusted for operating on the right or left tonsil without changing position of the instrument in the operator's hand. The forceps tips are preferably hook-shaped and are provided with pointed terminals 18 of suitable shape to penetrate the tissue which is to be coagulated.

Received within the recess 4 on the inner end of each electrode shaft is a pair of inter-meshing gears 19 and 20 formed of insulation material so that the current passed through the electrode shafts will not short through the gears.

Fixed on the electrode shaft 10 adjacent the gear 19 and extending through a slot 21 formed in the plate 5 is a thumb lever 22 whereby the shaft 10 may be rotated to position the forceps tips 16 and 17, as shown in Fig. 3.

In order to supply current to the electrode shafts we provide spaced spring contact members 23 and 24, each having fixed ends 25 secured to a wall of the recess 4 by screws 26 and yielding free ends 27 bearing against the respective shafts 10 and 11, as best illustrated in Fig. 2.

Extending through a cylindrical bore 28 formed in the grip portion of the instrument are circuit wires 29 and 30 having their ends connected to the screws 26 of each contact spring, so that a current may be passed from any suitable type of diathermic machine to the spring contacts and through the contacts to the electrode shafts 10 and 11 which carry the forceps tips and through the tissue being coagulated.

In using an instrument constructed and assembled as described, the operator grips the handle portion thereof and presses upwardly on the lever 22 to rotate the shaft 10 in an anti-clockwise direction, (Fig. 3), and simultaneously with the movement of the shaft 10, the shaft 11 is rotated in the opposite direction. The forceps tips are then in opened position, ready to engage the tonsil tissue. The instrument is then brought into contact with the tonsil tissue and the thumb lever is pressed downwardly to rotate the shafts in reverse direction to close the tips. Continued pressure on the thumb lever will cause the points to penetrate the tonsil tissue.

Current then flows from one tip across to the other tip through the tonsil tissue, heating and coagulating the tissue due to resistance of the current. Owing to the fact that both terminals penetrate the tissue a fairly light current is sufficient to produce the coagulation effect desired.

The depth at which the current is discharged and amount of tissue coagulated, is controlled by the spacing and depth of penetration of the forceps tips. Since the current passes directly through the tissue from one tip to the other, the coagulation is always under the control of the operator and no accidentally deep slough that may result in a hemorrhage is likely to occur.

It is thus apparent that with out improved instrument the operator may coagulate only the selected portions of tissue which he picks up by the instrument and the current passing from one tip to the other destroys only that portion of the tissue between the points. The current therefore cannot go any deeper into the tissue than the operator desires.

The tips may be swung on their pivots as shown in Fig. 3 to enable the operator to treat both tonsils without changing his grip on the instrument.

From the foregoing it is apparent that we have provided a bi-polar electro forceps adapted for the coagulation of diseased tissues with a minimum of risk and inconvenience to the patient and which eliminates danger of professional hazards.

What we claim and desire to secure by Letters Patent is:

1. A diathermic instrument including a housing, a pair of electrodes mounted in the housing, tips movably mounted on each of said electrodes, means for supplying current to the electrodes for discharge across said tips, and means for adjustably spacing said tips.

2. A diathermic instrument including a housing, a pair of insulated electrodes mounted in the housing, electrode tips pivotally mounted on each of said electrodes, and means for supplying current to the electrodes for discharge across said tips.

3. A diathermic instrument including a housing, a pair of electrode shafts rotatably mounted in the housing, forceps tips associated with each of said shafts, means for supplying current to the electrode shafts for discharge across the forceps tips, and means for rotating the electrode shafts for adjustably spacing said tips.

4. A diathermic instrument including a housing, a pair of electrode shafts rotatably mounted in the housing, forceps tips pivotally mounted on said shafts, means for supplying current to the electrode shafts for discharge across the forceps tips, and means for rotating the electrode shafts for adjustably spacing said tips.

5. A diathermic instrument including a housing formed of insulation material, a pair of electrodes rotatably mounted in the housing, intermeshing gears on the electrode shafts to maintain said shafts in related position, forceps tips on each of said shafts, means for effecting actuation of one of the shafts to adjustably space the forceps tips, and means for supplying current to the electrode shafts for discharge between said tips.

6. A diathermic instrument including a housing, a pair of insulated electrodes rotatably mounted in the housing, intermeshing gears on said electrode shafts formed of insulation material, forceps tips on the electrode shafts, a lever associated with one of the shafts for rotating said shaft to adjustably space the forceps tips, and means for supplying an electric current to the electrode shafts.

7. A diathermic instrument including a housing having a grip portion and a barrel portion, a pair of electrodes mounted in the barrel portion of the housing, tips pivotally mounted on each of said electrodes, means for supplying current to the electrodes for discharge across said tips, and means associated with the grip portion of the housing for adjustably spacing said tips.

8. A diathermic instrument including a housing, a pair of insulated electrodes mounted in the housing, electrode tips on each of said electrodes, means for supplying current to the electrodes for discharge across said tips, and means for rotating one of the electrodes in said housing for adjustably spacing said tips.

9. A diathermic instrument including a housing, a pair of insulated electrodes mounted in the housing, electrode tips pivotally mounted on each electrode, means for sup-

plying current to the electrodes for discharge across said tips, and means for rotating one of the electrodes in said housing for adjustably spacing said tips.

In testimony whereof we affix our signatures.

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