July 17, 1923. 1,461,864

E. C. DAY

SURGICAL SNARE

Filed Dec. 24, 1919 3 Sheets-Sheet 1

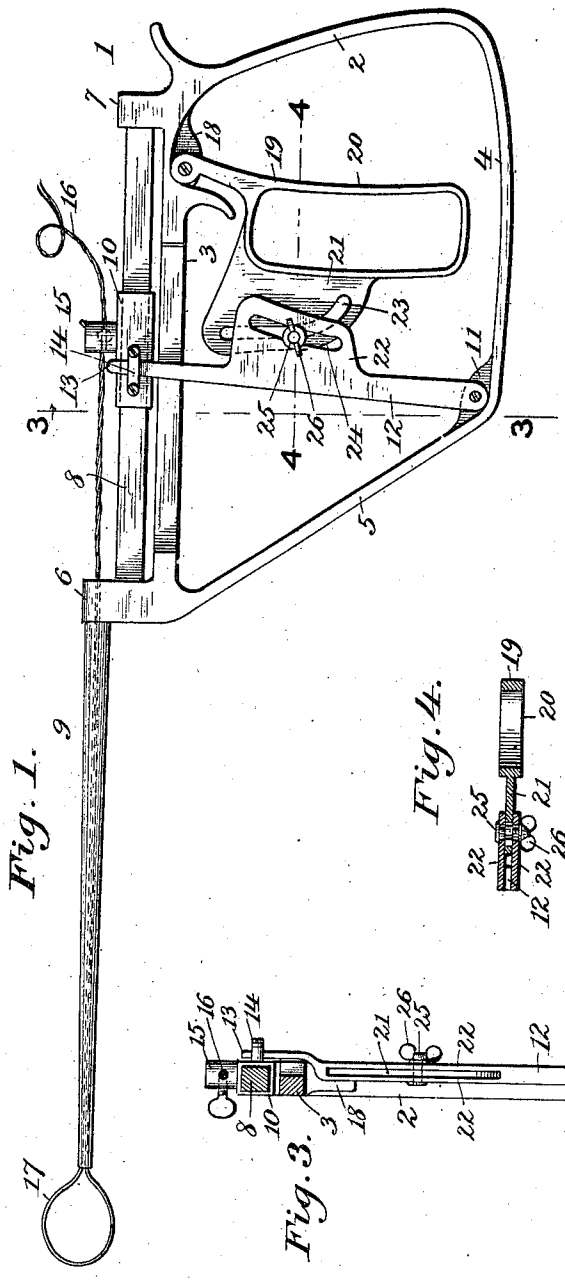


Fig. 1.

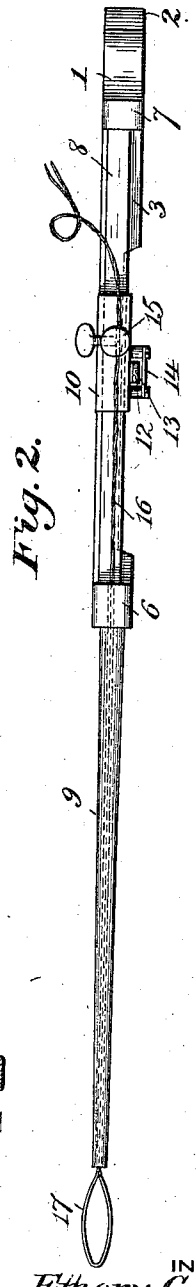


Fig. 2.

Fig. 4.

Fig. 3.

WITNESSES

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3 Sheets-Sheet 2

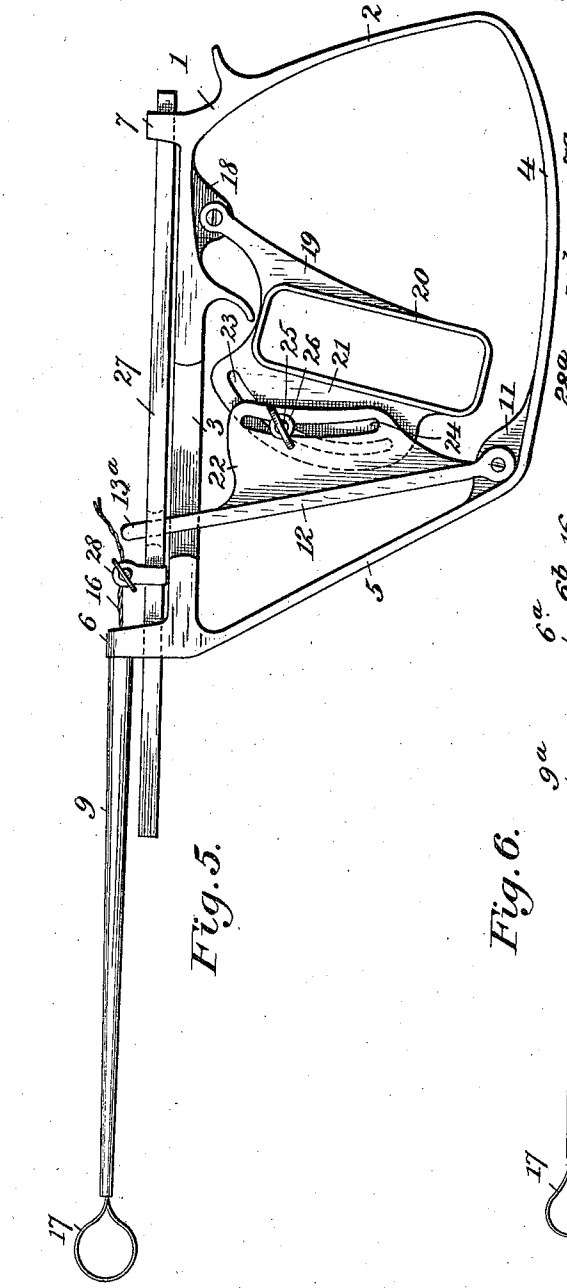


Fig. 5.

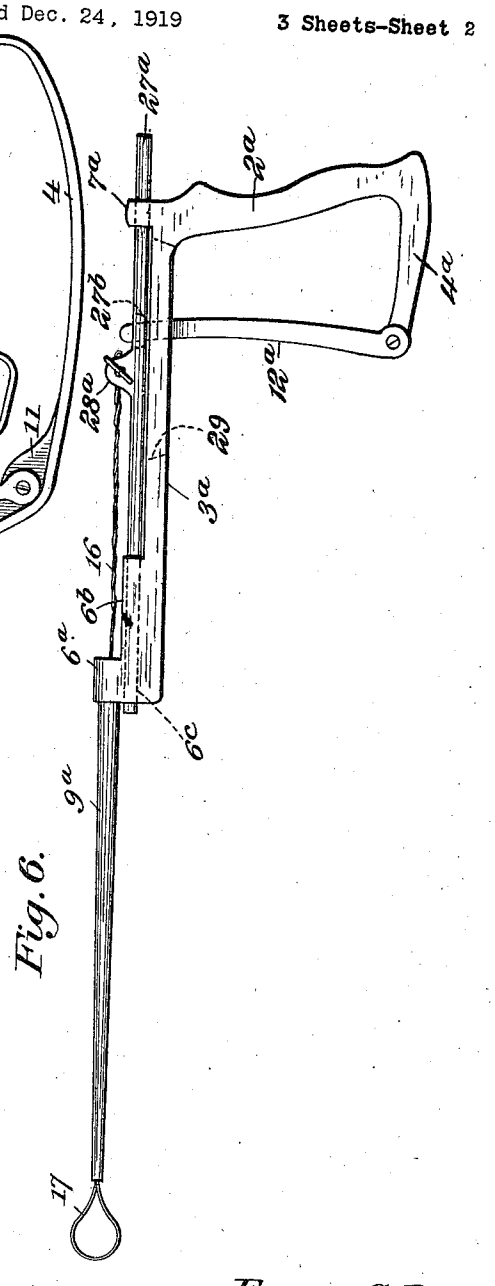


Fig. 6.

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SURGICAL SNARE

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3 Sheets-Sheet 3

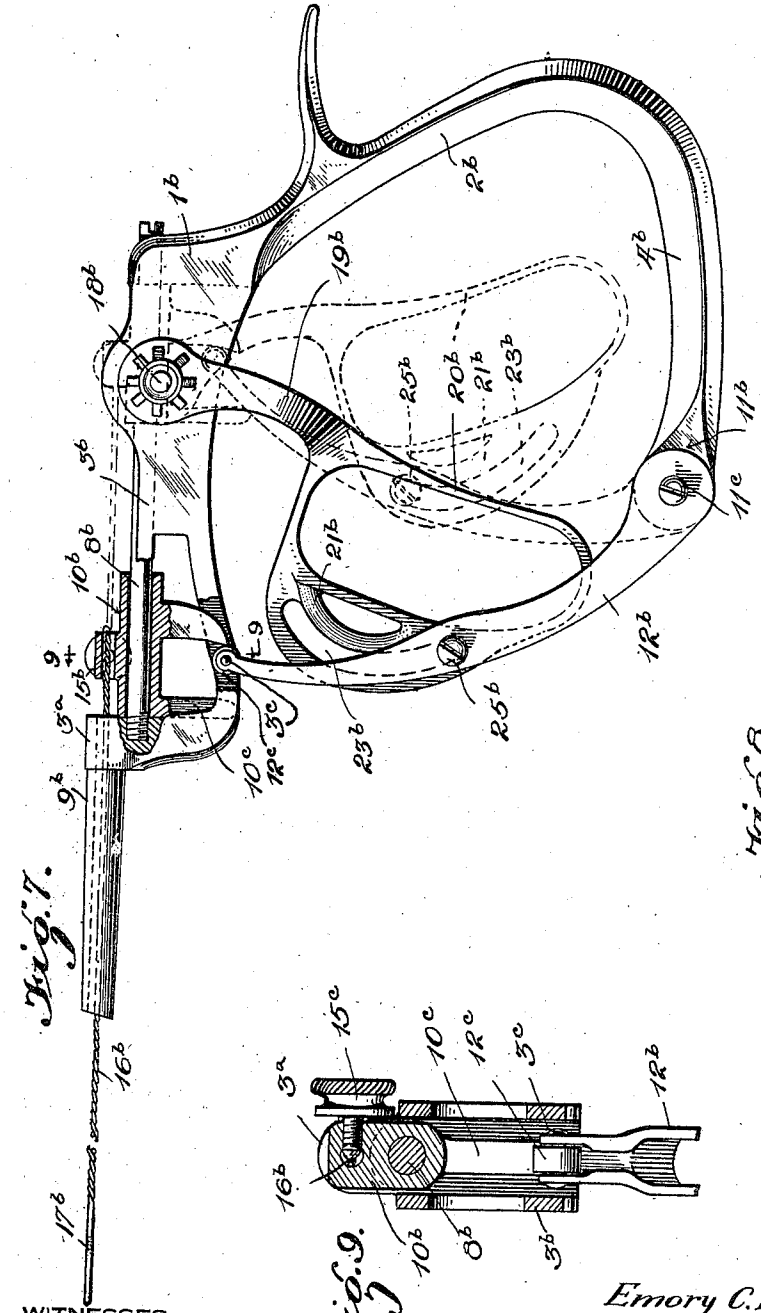


Fig. 7.

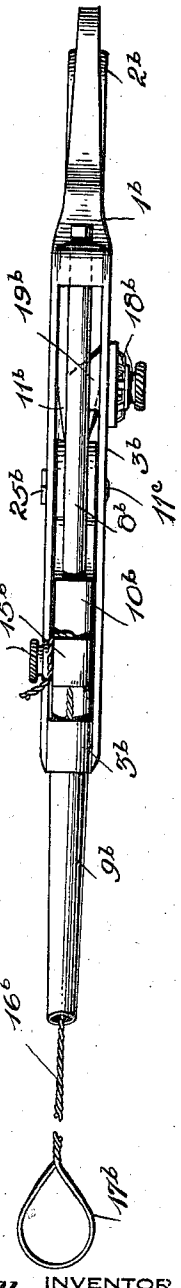


Fig. 8.

Fig. 9.

WITNESSES

Ernest C. Crocker

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Patented July 17, 1923. 1,461,864

UNITED STATES PATENT OFFICE.

EMORY CLAPP DAY, OF LAGUNA BEACH, CALIFORNIA.

SURGICAL SNARE.

Application filed December 24, 1919. Serial No. 347,156.

To all whom it may concern:

Be it known that I, EMORY C. DAY, a citizen of the United States, residing at Laguna Beach, in the county of Orange and State of California, have invented a new and useful Surgical Snare, of which the following is a specification.

This invention has reference to surgical snares, and its object is to remove tissue masses, either natural, such as normal tonsil, or pathological, such as enlarged or diseased tonsils, neoplasms or other tumors. The invention is of especial value for the removal of enlarged tonsils, and, without limiting the use of the invention to such particular purpose, the following description will be directed, in considering the operation of the invention, as applied to the removal of enlarged or diseased tonsils.

In accordance with the invention the usual snare is employed, such snare being customarily made of a strand looped upon itself and passed through a guide. Carrying the guide there is provided a handle, which may be a pistol grip handle so made as to give a firm hold to the instrument, and carried by the handle is a slidable or reciprocable member to which the snare is secured. In order to actuate the snare there is also provided a lever mechanism directly or indirectly connected to the slidable member, which latter is connected to the snare. The lever actuating mechanism for the snare operates on the principle of a lever of the third order, such arrangement permitting the holding of the body or handle of the instrument firmly in one position against the wrist end of the palm of the hand steadily while the fingers may then with one squeeze or pull accomplish the full actuation of the moving parts.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings,

Figure 1 is a side elevation of an instrument embodying the invention.

Figure 2 is a plan view thereof.

Figure 3 is a section on the line 3—3 of Figure 1.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a side elevation of an instrument similar to Figure 1 but differing therefrom in some particulars.

Figure 6 is a side elevation of a simple form of instrument to illustrate the principle of operation thereof.

Figure 7 is a side elevation, with some parts broken away, of still another embodiment of the invention.

Figure 8 is a plan view of the structure of Figure 7.

Figure 9 is a section on the line 9—9 of Figure 7.

Referring to the drawings and particularly to Figure 1, there is shown a frame 1, which may be an outline frame similar in shape to a pistol grip. This frame, as shown in Figure 1, comprises a handhold 2, a top member 3, a bottom member 4 and a forward brace 5 connecting the forward end of the top member with the forward end of the bottom member. Such frame is therefore a closed frame with the top member somewhat longer than the bottom member, and by closing the frame the body portion of the snare is strengthened.

At the forward and rear ends of the top members are upstanding lugs 6 and 7 respectively, and extending between and connecting the lugs is a bar 8 constituting a guide bar longitudinal of the bottom member. The lug 6 rises higher than the lug 7 and connected to and projecting forwardly from the lug 6 is a tubular guide 9 of such length as may be necessary.

The guide bar 8 has mounted thereon an elongated sleeve or slide 10 slidable along the bar without turning. The members 4 and 5 meet at an angle and are there formed into a rib 11 to which is pivoted one end of a lever 12, the other end 13 of which engages the block 10 as by a strap 14, so that as the lever is rocked about its pivot connection with the rib 11, the block 10 is

moved back and forth in accordance with the direction of movement of the lever. The sleeve 10 carries a binding post 15, to which is connected one end of a snare strand 16 carried through the lug 6 and guide 9 to the forward end of the latter where the snare is formed into a loop 17 to encircle the tissue it is desired to remove. Near the junction of the bars 2 and 3 there is provided a rib or web 18, to which is pivoted one end of a finger grip 19 of a lever 20 provided with a web 21 directed toward and entering between other webs 22 extending from the lever 12 toward the grip 19. The web 21 is provided with an elongated slot 23, while the webs 22 are provided with matching elongated slots 24. The webs 21 and 22 cross and are suitably curved for the passage of a connecting bolt 25 preferably, though not necessarily, furnished with

3ª, a rear bar 2ª, and a bottom bar 4ª, thus producing in effect a pistol-grip handhold. The top bar is elongated away from the rear bar and has lugs 6ª, 7ª at opposite ends, with the lug 6ª having a thickened portion 6ᵇ with a passage 6ᶜ therethrough alining with a similar passage through the lug 7ª. Mounted to slide in the passages through the lugs 6ª, 7ª is a bar 27ª, through which, at an appropriate point, is a slot 27ᵇ, while the bar 3ª has a longer slot 29 extending lengthwise of the bar 3ª and so arranged as to have the slot 27ᵇ registering with it as the bar 27ª is reciprocated. Extending from the lug 6ª is a tubular guide 9ª similar to the guide 9 and passing through which is a snare 16 having a snare loop 17 at the outer end. The inner end of the snare 16 is made fast by a clamp or binding post 28ª to the reciprocable bar 27ª, and the bar 27ª is actu-

by a binding screw 15^c. The sleeve 10^b is provided, within the interior of the top member 3^b, with spaced fingers 10^c between which a roller 12^c carried by the upper end of the lever 12^b, extends.

Traversing the top member 3^b near the rear end thereof is a pivot bolt or screw 18^b traversing one end of a lever 19^b terminating at the end remote from the pivot 18^b in a loop 20^b constituting a finger-hold. The lever 20^b on the side of the loop 20^b remote from the hand-hold 2^b has an extension 21^b in which there is formed a curved slot 23^b traversed by a bolt or screw 25^b carried by the lever 12^b intermediate of its length.

The structure of Figure 7 and associated figures has a similarity in action to that of Figure 1 and associated figures, except as to some matters of detail which are found to be advantageous both from a manufacturing standpoint and in actual use.

Each structure includes a handhold or frame, a slidable member guided to move in a straight line, a snare wire extending through a guiding tool and formed at one end into a loop while the other end is made fast to the slidable member, and a lever of the third order associated with and carried by the handhold and connected to the slidable member in such a way as to propel the latter to move the snare lengthwise of the snare guide.

The lever of the third order may be used alone to actuate the snare wire or may be used in conjunction with another lever, the two levers being then connected to constitute a compound lever with that one of the levers connected to the snare wire in the form of a lever of the third order.

What is claimed is:—

1. A surgical snare comprising a suitable body portion with a handhold, a snare wire guide on the body portion, and a lever of the third order carried by the body portion and connected to the snare wire, said lever and handhold being coactively related to be gripped by one hand of the user, with the gripping force applied in a direction away from the snare wire.

2. A surgical snare comprising a suitable body portion, reciprocable means on the body portion for carrying and actuating a snare wire, and a lever of the third order for operating the snare wire actuating means and located within reach of the hand of an operator holding the body portion, with the operating forces applied in a direction away from the snare wire.

3. A surgical snare comprising a suitable body portion with a handhold, a snare wire guide on the body portion, and a lever of the third order carried by the body portion and connected to the snare wire, said lever having a fingerhold intermediate of its length within the body portion for grasping the handhold and lever between the palm and fingers of the human hand.

4. A surgical snare comprising a body portion in the form of a closed frame, a lever of the third order mounted in the frame with a finger grip for actuating the lever and supporting the instrument by one hand of the user, a slidable member connected to the lever for actuation thereby, a snare guide, and a snare extending through the guide and fast to the slidable member.

5. A surgical snare comprising a handle, a snare guide projecting therefrom, a snare traversing the snare guide, a slidable member mounted on the handle and connected to the snare, a lever of the third order connected to the slidable member for actuating the latter, and gripping means associated with the lever for grasping the gripping means and lever by one hand to actuate the lever.

6. A surgical snare having a body portion, a slidable member mounted on the body portion, a snare wire connected to the slidable member, a lever of the third order on the body portion and connected to the slidable member for actuating the latter, and gripping means associated with the lever to be both grasped by one hand to actuate the lever.

7. A surgical snare comprising a body portion in the form of a frame with top, bottom, front and rear bars with the rear bar shaped to be grasped by the human hand, spaced lugs rising from the top bar, a guide bar extending between the lugs, a slidable guide mounted on the guide bar, a snare guide projecting from one of the lugs, a snare extending through the snare guide and secured to the slidable guide, a lever of the third order pivoted to the frame and engaging the guide, and another lever carried by the frame and connected to the first-named lever, whereby the two levers constitute a compound lever.

8. A surgical snare comprising a body portion in the form of a frame with top, bottom and rear bars, with the latter shaped to be grasped by the human hand, a guide bar carried by the top bar of the frame, a slidable guide or sleeve mounted on the guide bar, a snare guide projecting forwardly from the top bar, a snare strand extending through the snare guide and secured to the sleever, a lever of the third order pivoted to the frame and engaging the sleeve, and another lever carried by the frame and acting upon the first-named lever through a slidable connection whereby the two levers constitute a compound lever.

9. A surgical snare comprising a body portion with marginal bars one of which constitutes a gripping member, a guide bar

on the body portion, a slide thereon, a binding post carried by the slide, a snare guide extending forwardly from the body portion, a snare strand extending through the snare guide and connected to the binding post, a lever of the third order pivoted to the forward part of the body portion and engaging the slide, and another lever connected to the body portion and to the first-named lever and shaped to be engaged by the fingers of the hand carrying the frame.

10. A surgical snare comprising a body portion in the form of a frame, a slide mounted on the frame for movement to and fro therealong, a snare guide extending forwardly from the frame, a snare strand extending through the snare guide and connected to the slide, a lever of the third order mounted in the forward part of the frame and connected to the slide, another lever mounted in the rear part of the frame and adapted to be engaged by the fingers of the human hand in turn engaging the frame, the second-named lever having a slot therein traversed by a connecting member engaging the first-named lever intermediate of its length and said levers together constituting a compound lever.

11. A surgical snare comprising a body portion in the form of an open frame composed of top, rear and bottom members with the rear member constituting a hand grip, a snare guide extending from the forward end of the top member, a guide bar on the top member, a slide on the guide bar, a binding post carried by the slide, a snare strand extending through the snare guide and connected to the binding post, a lever of the third order pivoted at one end to the forward end of the bottom member and at the other end engaging the slide, and another lever pivoted to the top member and connected to the first-named lever, said second-named lever being shaped to be engaged by the fingers of the hand grasping the rear member.

12. A surgical instrument having a body comprising a handhold, a top member and a bottom member, with the top and bottom members extending forwardly from the handhold at the upper and lower ends. a slide mounted on the body, a compound lever comprising an upstanding lever pivoted at the lower end to the bottom member and connected at its upper end to the slide, a manipulating lever pivoted at its upper end to the body and depending downwardly in the space between the first-named lever and the handhold, and a pin and slotted connection between the two levers at a point between their two pivots.

13. A surgical instrument comprising a body with a handhold at the rear simulating a pistol grip, a guide for a surgical device on and projecting forwardly from the body, a slide for connection to the surgical device, and a compound lever for actuating the slide, said compound lever having one member pivoted at the lower end and connected to the slide, and the other member pivoted at the upper end and slidably connected to the first-named member between the two pivots of said members.

14. A surgical instrument comprising a body with a handhold at the rear simulating a pistol grip, a guide for a surgical device on and projecting forwardly from the body, a slide for connection to the surgical device, and a compound lever for actuating the slide, said compound lever having one member pivoted at the lower end and connected to the slide, and the other member pivoted at the upper end and slidably connected to the first-named member between the two pivots of said members, said slidable connection consisting of a pin on one member engaging a curved slot of the other member.

15. A surgical instrument comprising a body portion with a handhold at the rear end simulating a pistol grip, a guide for a surgical device on and projecting forwardly from the body portion, a slide for connection to the surgical device, a compound lever having one member thereof constituting a lever of the third order and acting directly on the slide, and another lever between the first named lever and the handhold and slidably connected to the first-named lever and adapted to be grasped by the fingers of the hand with the handhold lodged in the palm of said hand.

16. A surgical instrument comprising a body portion with a handhold at the rear end simulating a pistol grip, a guide for a surgical device on and projecting forwardly from the body portion, a slide for connection to the surgical device, a compound lever having one member thereof constituting a lever of the third order and acting directly on the slide, and another lever between the first-named lever and the handhold and slidably connected to said first-named lever and adapted to be grasped by the fingers of the hand, with the handhold lodged in the palm of said hand, the first-named lever member of the compound lever having its pivot low in the instrument, and the second-named lever member having its pivot high in the instrument.

17. The combination with a body having a handhold, of a slide on and guided by the body, a surgical device attached to the slide, an upstanding lever pivotally mounted at its lower end and engaging the slide at its upper end, a second lever located between

the first-named lever and the handhold and in operative relation to the latter, said second-named lever being pivotally mounted at its upper end to the body, and connected to the first-named lever by a curved slot engaged by a pin provided on said elements above the pivot of the first-named lever, whereby the two levers operate as a compound lever to draw the slide and snare in a direct line toward the operator.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

EMORY CLAPP DAY.

Witnesses:
ROY N. PEACOCK,
FRED R. CLAPP.