

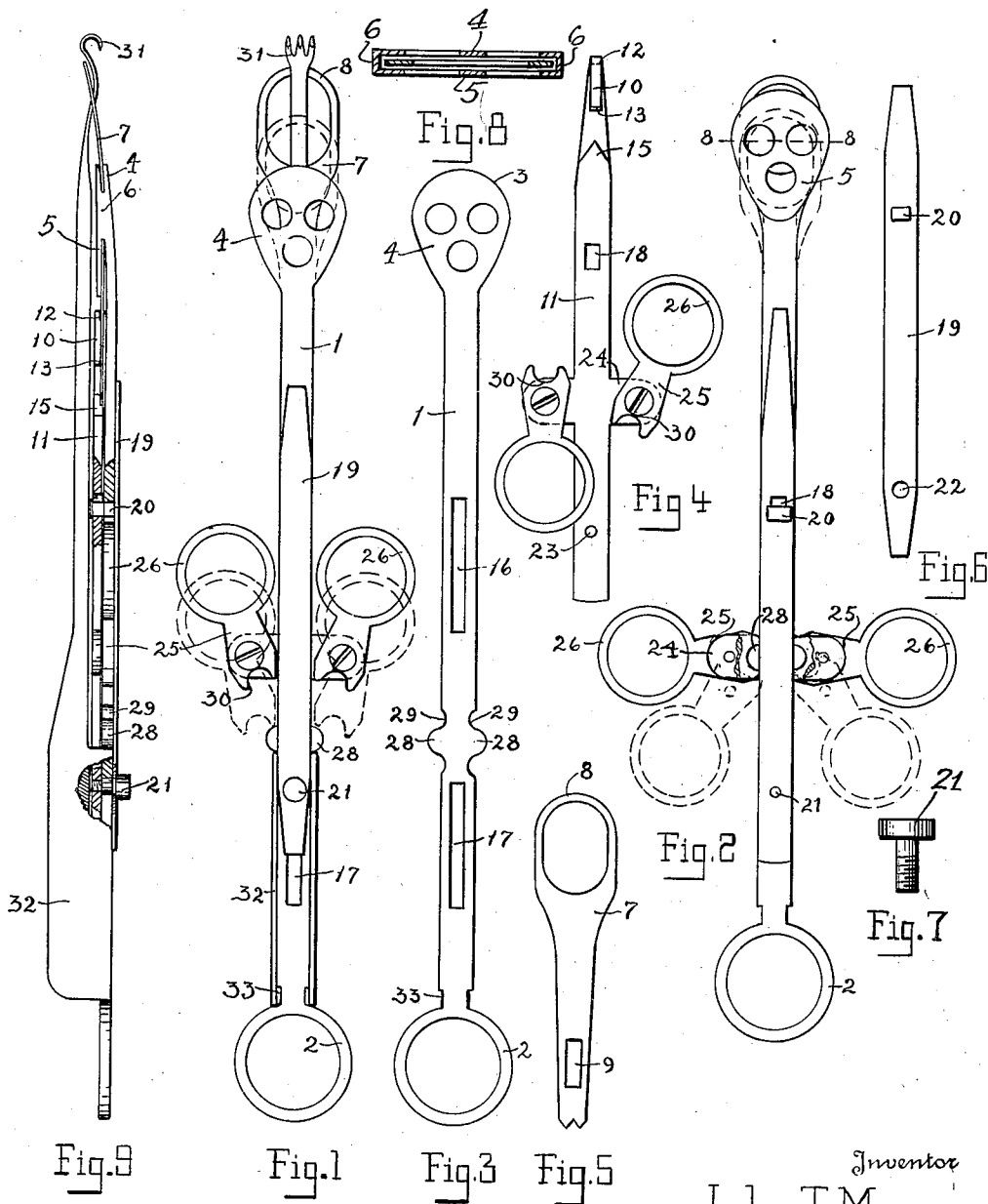
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TONSILLOTOME

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# UNITED STATES PATENT OFFICE

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## TONSILLOTOME

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4 Claims. (Cl. 128—309)

This invention relates to instruments of the surgical snare type which are specially adapted for removing tonsils. It is in the nature of an improvement on the instrument which forms the subject matter of application Serial No. 127,705, filed Feb. 25, 1937.

The primary object of the invention is to provide a lever arrangement which will be brought into operation only at the time at which the resistance of the tissues to crushing and cutting becomes sufficient to make a direct pull by the fingers difficult.

A further object is to provide a construction having a small number of parts which are readily taken apart for cleaning and sterilization and which are easily assembled for use.

In the drawing representing a preferred embodiment of the invention, Figure 1 is a top plan view of the entire device assembled ready for use and with a tonsil hook lying within the loop of the snare; Fig. 2 is a bottom-plan view of the device with the levers in the position to exert their greatest force with the hook removed and with the outer end of the snare close to the counterpressure bar; Fig. 3 is a top plan view of the counterpressure bar; Fig. 4 is a top plan view of the snare bar with the levers pivoted thereon; Fig. 5 is a plan view of the snare; Fig. 6 is a bottom-plan of the retention clip; Fig. 7 is an elevation of the screw which connects the snare bar with the retention clip; Fig. 8 is a section through the guideway on the line 8—8 of Fig. 2, and Fig. 9 is a side elevation of the device as seen from the left in Fig. 1.

A counterpressure bar 1 has a thumb loop 2 at one end and an expanded guide portion 3 at the other end comprising two flat perforated plates 4 and 5 connected at each side as at 6, to form a guideway therebetween for a flat snare 7 of the form shown in Fig. 5. The snare will be made of stainless steel or of any other suitable material having the necessary strength, resiliency, durability and capacity for being easily sterilized.

The broad front end of the snare is perforated to form a loop having a narrow rim portion 8 at its forward end, and near its rear end, it has a slot 9 to receive a lug 10 at the front end of the snare bar 11. The lug 10 has a notch 12 at its front end to receive the portion of the snare at the front end of the slot 9, the notch being deep enough to permit rearward movement of the snare to a point at which the rear end of the slot 9 can clear the rear end of the lug 10. The flexible rear end of the snare can then be pressed down and slid forward to bring the rear end of

the slot 9 into a notch 13 in the rear end of the lug 10, this forward movement being sufficient to carry a V-shaped notch 14 in the rear end of the snare to the front end of a V-shaped elevation 15 on the snare bar. The rear notch 13 is not as deep as the front notch 12 and the snare thus cannot slide forward enough to disengage from the lug at its forward end, but the resilient rear end will bend down in engagement with the sides of the elevation 15 which will thus prevent rearward movement of the snare out of the slot or notch 13 as well as prevent sidewise movement of the end of the snare on the snare bar. This form of engagement is the same as that shown in the previous application mentioned above.

The counterpressure bar 1 has two longitudinal slots 16 and 17 and the snare bar has a relatively short slot 18 which in the assembled position of the device lies opposite the slot 16. A retention clip 19 has a T-shaped lug 20 which can be passed through the slots 16 and 18 when the clip lies at right angles to the snare bar and counterpressure bar, and when the clip is then rotated a quarter turn, the ends of the lug will extend on both sides of the slot 18 as shown in Fig. 2. The screw 21 is then passed through an opening 22 in the clip 19 and through the slot 17, to enter a threaded opening 23 in the snarebar.

It will be evident that the lug 20 and the screw 21 can slide longitudinally of the slots 16 and 17 respectively, one end of either slot acting to limit the forward and rearward sliding movement of the snare bar on the counterpressure bar. The clip 19 is preferably resilient and bent enough to exert pressure on the two bars to hold them together while permitting easy sliding.

A pair of lugs 24 project from opposite sides of the snare bar 11 each lug having a lever 25 pivoted thereto and a finger loop 26 is formed in each lever for easy engagement by the fingers of the same hand of which the thumb engages the loop 2 of the bar 1.

When assembled, the finger loop ends of the levers are at the forward end, as shown in Fig. 1 in the full line position, with the inner sides of the loops closely adjacent to the straight sides of the counterpressure bar and with the sides 27 of the opposite ends of the levers also closely in contact with the sides of the bar 1 below the pivots of the levers. The snare bar can slide freely from the full line position to the broken line position of the levers in Fig. 1, but the levers cannot swing outward on their pivots because of the engagement of the lower ends of the levers against the sides of the bar 1.

The counterpressure bar has a pair of lugs 28 projecting from opposite sides between the slots, and as the levers slide to the broken line position, their ends engage with the lugs. On each side of the bar 1 and on each side of the lugs, recesses 29 are formed of sufficient depth to permit the lower ends of the levers to swing inward. In the end of each lever 25, a notch 30 is formed of a depth such that the levers can swing around their pivots with the ends of the lugs 28 entering into the recesses 30 as indicated in Fig. 2 in full line position.

In Fig. 1, the snare is shown in full lines as extending outward beyond the end of the guide portion 3 to a point at which substantially the whole loop is available to receive a tonsil. In the broken line position, the loop has slid about the length of half of the opening, and as the levers swing outward to the full line position of Fig. 2, the loop enters the guideway passage in the end of the bar 1 until only a narrow opening is left. This is the position in which the tissues offer the greatest resistance to further movement of the loop. They have been crushed and compressed in bringing them to this point, but considerable force is still required to complete the severance. The levers, in engagement with the lugs 28 and extending at substantially right angles to the bar 1 afford a leverage of about three to one, and as they move from the full line position to the broken line position, the loop is pulled entirely into the guideway.

It will be seen that during the first part of the movement of the snare into the guideway passage, the action of the loop is a direct pull of the rim portion 8 against the relatively blunt front edge of the counterpressure bar, resulting in a crushing action, but as the loop reaches the position shown in full lines in Fig. 2, the edge of the loop moves transversely of the curved front edge of the guide plates 4 and 5 to give a shearing action to sever the fibers of the anterior pillar after the tonsil tissue has been crushed.

The tonsil hook 31 has a handle portion 32 to engage the sides of the bar 1 and the notches 33 near the thumb loop act to prevent longitudinal sliding movement of the handle as the hook and tonsillotome are grasped in the hand of the operator with the hook through the loop as shown in Fig. 1. The tonsil engaged by the hook is dissected loose in the usual way from the anterior pillar, the snare is then slid off the hook around the tonsil and the loop is drawn into its guideway by sliding the snare bar along the counterpressure bar 1 until the lever ends engage the lugs 28. A continued pull on the levers 25 will rotate them outward on their pivots to move the loop the short remaining distance into its guideway, shearing off the last remaining fibers smoothly and cleanly.

While the design shown in the drawing has proved efficient in actual use, it will be evident that many changes in size, form, and proportion of parts and in the details of construction may be made without departing from the invention as claimed.

I claim:

1. A surgical instrument comprising a coun-

terpressure bar having a guideway formed therein, a snare bar slidably mounted upon the counterpressure bar and having a snare thereon projecting through said guideway, levers pivoted on opposite sides of the snare bar and engageable at their inner ends with opposite sides of the counterpressure bar to force it longitudinally of the snare bar as the snare is drawn into the said guideway.

2. A surgical instrument comprising a counterpressure bar having a guideway formed therein, a snare bar slidably mounted upon the counterpressure bar and having a snare thereon projecting through said guideway, levers pivoted upon opposite sides of said snare bar, a lug projecting from each side of the counterpressure bar for engagement with the end of the lever on the corresponding side of the snare bar whereby to force the counterpressure bar longitudinally of the snare bar as the lever is swung on its pivot.

3. A surgical instrument comprising a counterpressure bar having a guideway formed therein, a snare slidable within the said guideway, a snare bar to which the snare is detachably connected, the snare bar being slidably connected with the counterpressure bar, and levers pivotally connected with opposite sides of the snare bar and having their end portions in slidable engagement with the counterpressure bar from a position in which the snare projects outward from the guideway to a position in which the snare is partially withdrawn into the guideway, the counterpressure bar having recess at points opposite the ends of the levers at the inner end of their sliding movement on the counterpressure bar, the recesses permitting a swinging movement of the levers outward on their pivot with the ends of the levers in engagement with the counterpressure bar to cause further relative movement of the snare bar and the counterpressure bar sufficient to withdraw the snare entirely within the guideway.

4. A surgical instrument comprising a counterpressure bar having a guideway formed therein, a snare slidable within the guideway, a snare bar to which the snare is secured, the snare bar being slidably connected with the counterpressure bar and having lugs on opposite sides thereof, levers pivotally connected with the lugs and having their end portions in slidable engagement with opposite sides of the counterpressure bar from a position in which the snare projects outward from the guideway to a position in which the snare is partially withdrawn into the guideway, the counterpressure bar being formed with lugs engageable by the ends of the levers at the end of their sliding movement and being formed with recesses adjacent to said lugs to permit inward movement of the inner ends of the levers as their outer ends swing outward, the inner ends of the levers being formed to engage the lugs on the counterpressure bar whereby to force the counterpressure bar longitudinally of the snare bar as the levers swing outward around their pivots.

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