

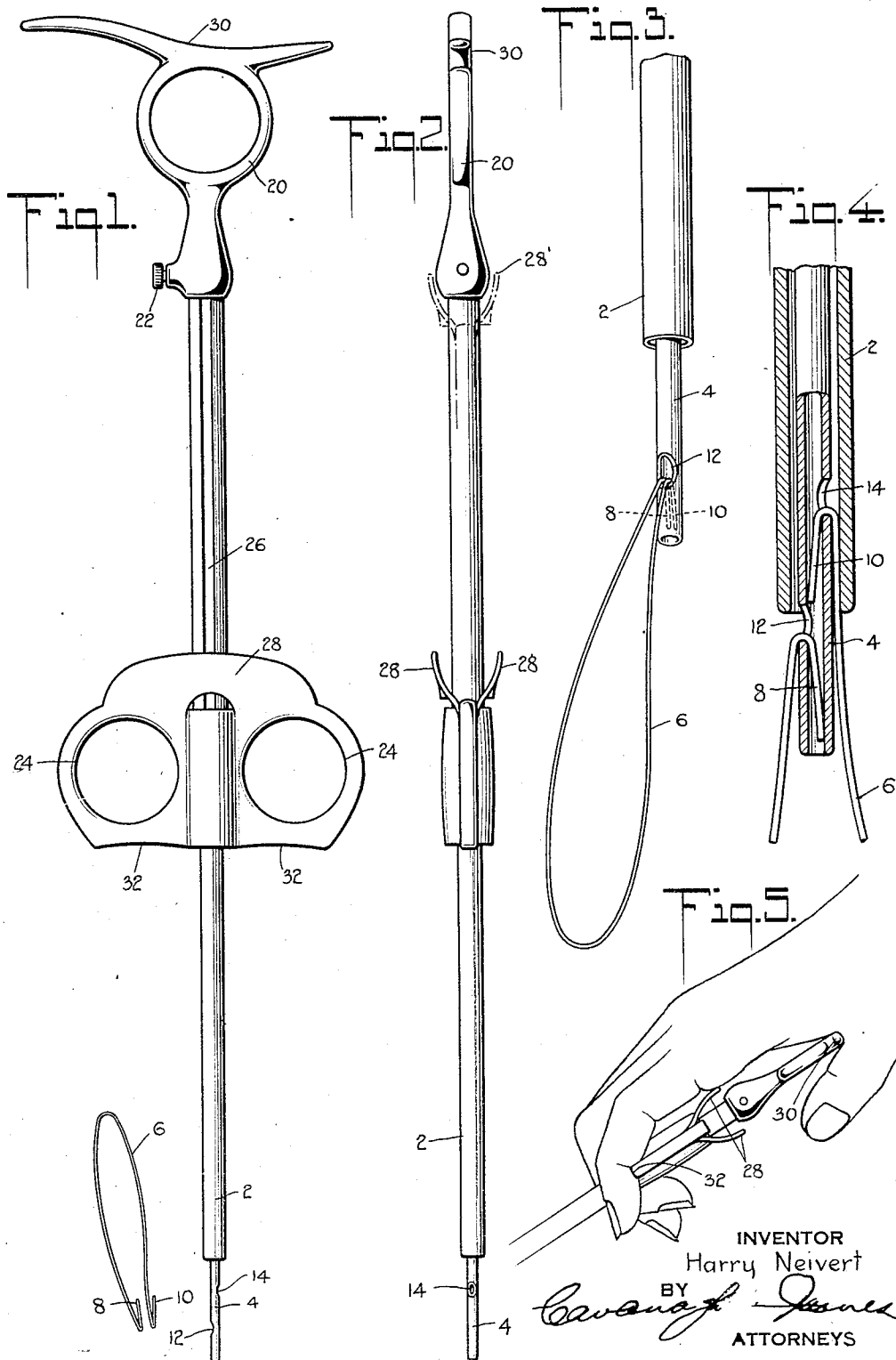
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SURGICAL SNARE

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SURGICAL SNARE

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This invention relates to surgical instruments, and more particularly to a surgical snare.

A snare is often used in surgical operations, particularly in tonsilectomy. The conventional snare includes relatively movable members, one of which is arranged to receive the bent or hook-like ends of a snare wire, and suitable additional mechanism for relatively moving the members so as to tighten the snare loop. These instruments are characterized by considerable difficulties and disadvantages which center about the method of anchoring the ends of the snare wire on the movable member. To begin with it is difficult to thread or mount the snare wire on the instrument. After the wire is mounted and while the instrument is fully open to expand the loop the hooked ends of the wire project from the instrument and are a source of annoyance and danger, inasmuch as they may catch on the patient's lip during the insertion of the instrument in his mouth, or on the back of the patient's throat when beginning to use the instrument.

After the loop has been contracted and pulled within the instrument to remove one of the tonsils, difficulty frequently arises in opening the instrument due to the fact that the hooked ends of the wire tend to catch on the inner wall of the instrument when it is attempted to move them in the outward direction. When the instrument has been opened it is customary for the surgeon to expand the loop with his fingers in preparation for the removal of the second tonsil, and during this step the doctor's fingers may be scratched or cut by the exposed bend or hooked ends of the snare. This is particularly inconvenient because the snare wire is at this time badly contaminated because of its previous contact with the diseased tonsil. After the second tonsil has been removed, difficulty again arises in removing the snare wire from the instrument.

One primary object of my invention is to overcome all of these difficulties and disadvantages, and to provide a surgical snare which will prevent injury to the patient and surgeon during the operation, which is adapt-

ed for readily receiving the snare wire, and which will be smooth in operation both when contracting as well as when expanding the snare loop.

The mechanism for causing relative movement of the fixed and movable members of the snare in order to tighten the loop ordinarily comprises appropriate finger grips on the fixed and movable members which are pulled together during the operation. As ordinarily constructed, difficulty arises when the finger grips are brought nearly together because of the fact that the fleshy part of the palm and fingers of the hand of the surgeon is apt to be caught between the finger grips, and squeezed or pinched when he applies full pressure to complete the operation. It is a further object of the present invention to overcome this difficulty, and to shield the hand of the surgeon against pinching without meanwhile interfering with the operation of the instrument over the full possible range of movement.

The pressure which may be applied on the instrument tends to decrease when the finger grips are brought close together, inasmuch as the operating hand is then nearly fully contracted. The difficulty cannot be solved simply by spacing the grips further apart, inasmuch as considerable range of movement is needed and the grips must be within convenient reach when the instrument is fully expanded. In accordance with a further object of my invention, the instrument is so designed that the operation may proceed in a number of different stages, in each of which the hand may be differently positioned on the finger grips so as to permit the application of optimum pressure on the instrument.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the surgical snare elements and their relation one to the other, as hereinafter are more particularly described and sought to be defined in the claims. The specification is accompanied by drawings which show the preferred embodiment of my invention, and in which:

Fig. 1 is a front elevation of my improved snare;

Fig. 2 is a side elevation of the same;

Fig. 3 is a detail of the end of the snare;

Fig. 4 is a section taken through the end of the snare; and

Fig. 5 illustrates one stage in the operation of the snare.

Referring first to Figs. 3 and 4 of the drawings, the snare comprises relatively movable members 2 and 4 and a snare wire or loop 6. Additional mechanism of any desired type may be provided for causing relative movement of the members 2 and 4. For convenience of reference, I shall refer to the member 2 as a fixed member, and the member 4 as a movable member which acts as a pull rod and may be drawn within the fixed member 2 in order to contract or tighten the snare loop 6 until the latter is finally drawn entirely within the fixed member 2.

The snare wire 6 is not really a part of the instrument per se, inasmuch as a new wire is used for each operation. A length of wire is bent in the form of a loop and the ends are bent to form the hooks 8 and 10. In prior instruments the movable member 4 consisted of a flat or sometimes a channel-shaped strip of metal which was provided with a plurality of spaced apertures, and the wire was threaded thereon by inserting one of the hooks through one of the apertures, and thereafter inserting the other of the hooks in the opposite direction through another of the apertures. Inasmuch as the wire is a high grade of steel piano wire or like resilient wire, this operation frequently proved troublesome. In the present instrument the hooks 8 and 10 may simply be inserted in the single aperture 12 of the movable member 4 which, of course, may be done with rapidity and ease.

The movable member 4 is then pulled within the fixed member 2 sufficient distance for the beginning of the loop to reach the fixed member in order to prevent the loop from escaping from the movable member. In prior instruments the ends of the hooks 8 and 10 would at this time frequently project slightly, or even considerably, from the end of the fixed member 2, and this would prove a source of considerable annoyance because the sharp ends of the wire were apt to catch on the lips or throat of the patient. Furthermore, after the loop had been fully contracted by pulling the same within the fixed member, it was sometimes difficult to again eject and expand the loop, inasmuch as the ends of the wire would tend to expand outwardly against the inner walls of the fixed member 2 and catch in the same during the outward movement. Then, when the surgeon attempted to spread the sides of the loop apart preparatory to removing the second tonsil, he was apt to cut his fingers on the ends of the snare. All of these difficulties are overcome in the present invention by providing the movable member 4 with means for receiving and protectively

housing the ends of the snare wire. In the present case this is done by making the movable member 4 hollow, so that when the hooked ends 8 and 10 of the snare are inserted through the aperture 12 the ends are protectively housed within the hollow interior of the movable member. Structurally the desired results may most simply be obtained by making the movable member or pull rod 4 in the form of a tube, the diameter of which, of course, should be less than the inside diameter of the fixed tube 2 by about twice the diameter of the snare wire.

The tubular pull rod 4 is preferably provided with a plurality of apertures such as the apertures 12 and 14 shown in Fig. 4, and the hooks 8 and 10 may both be hooked together in either the aperture 12 or the aperture 14, or, if desired, one hook may be inserted in each of the apertures in the manner illustrated in Fig. 4. In any case, it will be evident that the springy and relatively sharp ends of the hooks 8 and 10 are housed within the rod 4, and therefore can never expand outwardly to prevent downward movement of the rod 4 with respect to the rod 2, and are protectively shielded so that they can not scratch or cut the patient or surgeon at any time during the entire operation.

The conventional manner in which the movable pull rod 4 may be drawn within the fixed tube 2 is by means of relatively movable finger grips of the general type illustrated in Figs. 1 and 2 of the drawings. A fixed finger grip 20 is detachably attached by means of a thumb screw 22 to the upper end of the fixed member 2. A movable finger grip comprising a pair of finger rings 24 is arranged to surround and to slide on the outside of the fixed member 2. It is attached to the movable member 4 by means of a cross bridge, not shown, which slides within a slot 26 cut through the upper portion of the fixed member 2. By removing the thumb screw 22 the entire instrument may be disassembled for cleaning and sterilization.

The snare wire 6 is hooked on the movable member 4, and the finger grips 20 and 24 are brought together sufficiently to anchor the ends of the loop within the fixed member 2. To use the snare the thumb is placed in the finger grip 20, the index and middle fingers are placed in the finger rings 24, and the hand is contracted to pull the finger grips together, and so to contract the snare loop. Considerable range of movement is needed in order to have a full opening of the loop when the operation is begun. At the end of the operation the finger grips therefore come quite closely together and, inasmuch as considerable pressure is needed, I have found that the fleshy part of the fingers and palm of the hand is frequently caught and pinched between the fixed and movable finger grips. This is particularly true due to the presence

of the thumb screw 22, which, however, is essential for facilitating cleaning of the instrument.

To prevent this annoyance I provide the movable finger grip or finger rings 24 with a shield 28 extending backward on either side of the movable finger grip, in the manner shown in the drawings. This shield presents an added surface to the fingers of the surgeon which makes it possible for him to exert greater pressure on the instrument and at the same time protects the hand against pinching, for when the finger grips are brought together the sides of the shield 28 surround the lower end of the fixed finger grip and the thumb screw 22, as is schematically indicated by the dotted line position 28' in Fig. 2.

When the fixed and movable finger grips are brought nearly together the hand of the surgeon is so nearly completely closed that it is difficult to obtain the desired pressure. Accordingly, the operation may be begun with the thumb in ring 20 and the index and middle fingers in rings 24, as was before explained. When, however, the operation has partially proceeded, the strength of grip may again be increased by anchoring the thumb in back of ring 20 and against the pressure surface 30 on top of the fixed grip. Finally, when the finger grips have been brought almost together, the strength of the grip may again be increased to permit the application of extra pressure by removing the fingers from rings 24 and applying the same to the pressure surfaces 32, which I provide on the lower face or side of the rings 24 opposite the fixed grip 20. The position of the hand at this time is illustrated in Fig. 5, in which it will be observed that the thumb and palm of the hand is anchored in back of the fixed finger grip 30, while the fingers of the hand are applied against the movable pressure surface 32. It will also be evident that the fleshy part of the hand is protected against pinching by the protective shield 28.

The mode of constructing and using and the many advantages of my improved surgical snare will, it is thought, be apparent from the foregoing detailed description thereof. The snare wire may readily be applied to and removed from the instrument, and the hooked ends thereof are protectively housed to prevent injury during the operation and to insure that the sliding movement of the instrument will be smooth in the outward as well as in the inward direction. The hand of the surgeon is protected against pinching during the operation and the application of extra pressure is facilitated by the provision of broad pressure surfaces, different ones of which may be successively employed at different stages of the operation so that optimum pressure may always be obtained.

It will be apparent that while I have shown and described my invention in the preferred

form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention defined in the following claims.

I claim:

1. A surgical snare comprising a fixed member, a member movable relative to the fixed member for pulling the hooked ends of a snare wire into the fixed member in order to tighten the snare loop, and means for causing relative movement of the movable and fixed members, said movable member being hollow and provided with an aperture in the wall thereof for receiving the ends of the snare wire and protectively housing the same within the said hollow member.

2. A surgical snare comprising a fixed member, a member movable relative to the fixed member for pulling the hooked ends of a snare wire into the fixed member in order to tighten the snare loop, and means for causing relative movement of the movable and fixed members, said movable member being tubular and provided with one or more apertures in the tubular wall thereof for receiving the ends hooked of the snare wire, whereby the said hooked ends are carried within and protectively housed by the tubular member.

3. A surgical snare comprising a fixed tubular member, a member movable relative to the fixed member for pulling the hooked ends of a snare wire within the fixed tubular member in order to tighten the snare loop, and means for causing movement of the movable member within the fixed member, said movable member being tubular and provided with one or more apertures in the tubular wall thereof for so receiving the hooked ends of the snare wire that they are protectively housed within the tubular movable member.

4. A surgical snare comprising a fixed finger grip, a movable finger grip, and a shield for protecting the hand of the user when the fixed and movable finger grips are being operated.

5. A surgical snare comprising a fixed member, a finger grip thereon, a movable member for tightening the snare loop, a finger grip attached thereto, and a shield on the movable finger grip for protecting the hand of the user when the fixed and movable finger grips are brought close together.

6. A surgical snare comprising a fixed member, a finger grip thereon, a movable member, a finger grip attached thereto, said movable member being provided with one or more apertures for receiving and protectively housing the ends of a wire snare, and one of said finger grips being provided with a shield for shielding the hand of the user when the fixed and movable finger grips are operated.

7. A surgical snare comprising a fixed tubular member, a finger grip thereon, a mov-

able tubular member adapted to slide within the fixed tubular member, a finger grip attached thereto, said movable tube being provided with one or more apertures in the wall thereof for receiving and protectively housing the ends of a wire snare, said movable finger grip being provided with a pair of finger rings, and a shield adjacent said finger rings for shielding the hand of the user when the fixed and movable grips are brought nearly together.

8. A surgical snare comprising a fixed tubular member, a finger grip attached thereto, a movable tubular member adapted to slide within the fixed tubular member, a finger grip attached thereto for causing movement of the movable member within the fixed member, said movable member being provided with one or more apertures in the tubular wall thereof for receiving and protectively housing the ends of a wire snare, said movable finger grip being provided with a pair of finger rings, a shield adjacent said finger rings for shielding the hand of the user when the fixed and movable grips are brought nearly together, and a flat outer surface on the sides of the rings opposite the fixed finger grip for permitting the application of extra pressure when the fixed and movable grips are brought nearly together.

Signed at New York city, in the county of New York and State of New York this 12th day of July, A. D. 1930.

HARRY NEIVERT.

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