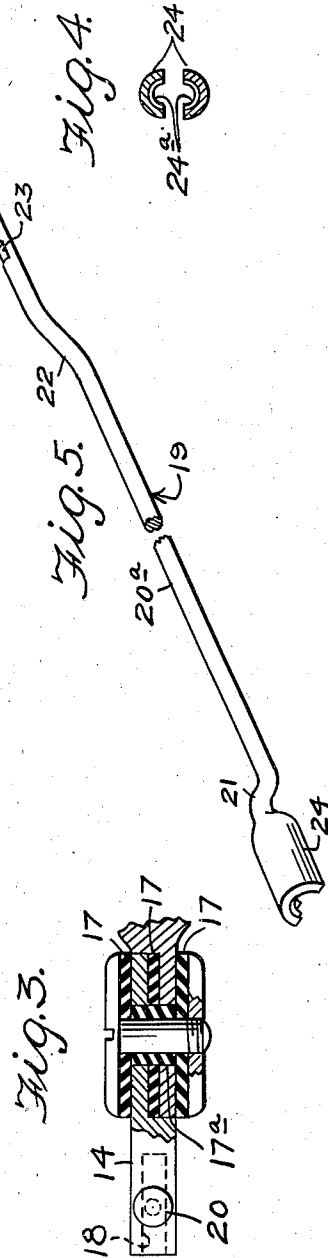
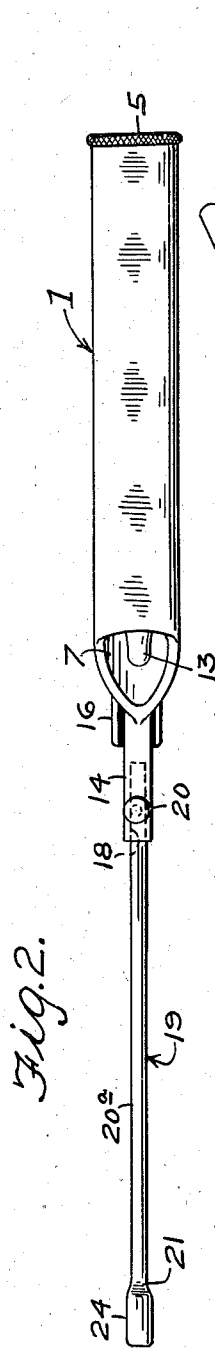
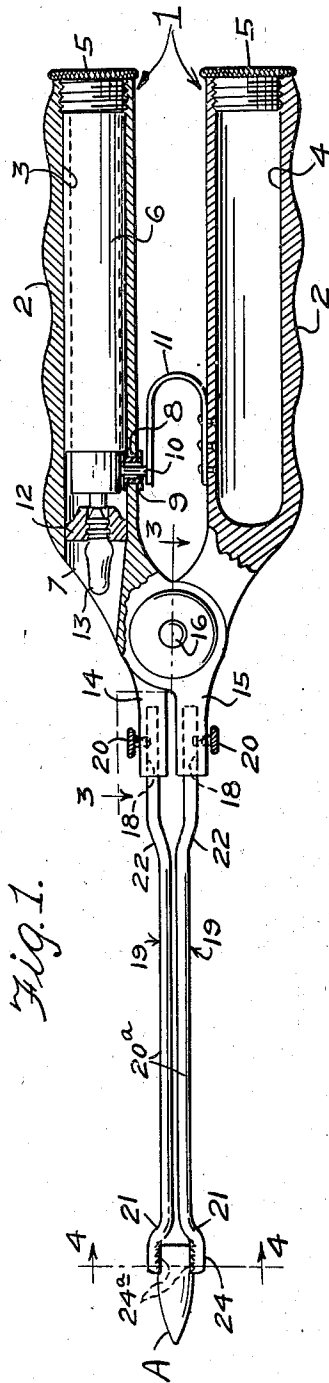


June 29, 1948.

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SURGICAL PROBING AND EXTRACTING
PLIER ELECTRICALLY CONTROLLED
Filed May 11, 1945

2,444,207



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2,444,207

SURGICAL PROBING AND EXTRACTING
PLIERS, ELECTRICALLY CONTROLLED

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Application May 11, 1945, Serial No. 593,188

5 Claims. (Cl. 128—2.1)

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My present invention, in its broad aspect, has to do with improvements in surgical probing, locating and extracting pliers with automatically operated electric means for signalling when an object being probed for, such as a bullet, has been located. To this end, I provide a unique handle means for improved probing tools, wherein an electric lamp and battery are provided which are normally out of circuit; the arrangement of parts being such that the circuit is fully completed only when the metallic object probed for, as for instance, a bullet, is located and firmly grasped by the tools. When the bullet has been grasped, the circuit is completed to the lamp to provide a signal and also to fully illuminate the operation of extraction. Another object of my invention is to provide an improved handle wherein the finger grip portions have compartments therein; one to receive the light and battery, and the other to receive tools, appliances, and accessories; and wherein the handle elements are fully insulated from each other and a spring tensioning device is provided which serves both to improve the operation of my device and fully complete the circuit to the lamp once the bullet, or other object, has been firmly grasped by the tool jaws.

Other and equally important objects and advantages of my invention are (1) to provide a device which can be kept in a highly sanitary condition, and can be readily cleaned and sterilized, (2) to provide a tool and handle which is practical and easily operated, and (3) to simplify, render more sturdy, and improve surgical instrument construction to the end that a more desirable implement is provided.

With the above and other objects in view, my invention resides in the broad inventive concepts characterized for purposes of illustration in the parts and arrangement of parts hereinafter described and illustrated.

In the drawings wherein I have illustrated a preferred form of my invention:

Figure 1 is a side view thereof, partly broken away, and in section to illustrate the several parts.

Figure 2 is an edge view.

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

Figure 4 is a section through the tool taken on the line 4—4 of Figure 1, and;

Figure 5 is a detail of one element of the tool, both elements being of similar construction.

In the drawings wherein like characters of reference are used to designate like or similar parts throughout the several views:

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The numeral 1 designates the handle elements which are exteriorly contoured as at 2 to provide finger grips, and each of which has an elongated compartment designated 3 and 4, respectively, formed therein. The exterior wall of each compartment is screw threaded to receive thereon an interiorly screwthreaded, knurled cap 5. Compartment 4 is fully closed when the cap 5 is applied and may be used to contain extra parts, tools, and the like. An opening 7 is provided in the compartment 3 opposite the cap 5 for a purpose to appear.

In compartment 3 is a battery 6, and adjacent the opening 7 of compartment 3 is a lateral opening 8 in which is mounted an insulating eye 9 to receive a contact stud 10 on the U-spring 11 attached to handle element 4. Mounted in the opening 7 of compartment 3 is a bushing 12 mounting a light bulb 13 which contacts with battery 6, so that when the tool elements (hereinafter described) are brought together to firmly grip a metallic object, such as a bullet A, and handle elements 3 and 4 are brought together against the tension of spring 11, the uninsulated part of battery 6 is contacted by stud 10 to complete the circuit whereby current will flow from the exposed portion of the battery case 6, in the upper handle element of Figure 1, through the stud 10 secured to the U-shaped spring 11, which being fastened to the lower handle element 1, will direct the current to the same and then through the upper tool element 19 to the jaw element 24. When a metallic object, such as A, is gripped by the jaw elements 24, forming part of 19, current will flow from the upper jaw element 24, through the metallic object A to the lower jaw element 24 and back through the lower tool element 19 to the upper handle element 1, and then through the bushing 12 to the light bulb 13 and back to battery, thereby lighting the bulb 13 whereby its rays are projected through the opening 7 to serve as a signal and facilitate removal of the object sought.

The handle elements have crossed shanks 14 and 15 respectively, which are offset with respect to each other as shown in Figure 3 and pivoted together by the screw 16, with intervening insulating washers 17 between adjacent parts of the handle elements, and an insulating bushing 17a about the screw, thereby to normally fully insulate the handle elements from each other. The ends of shanks 14 and 15 are bored as at 18 to receive the tool elements 19. Set screws 20 are provided to hold the tool elements in place.

Each tool element 19 has a long shank part 20a

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bent upwardly and then in line with the respective shank 14 or 15 as at 21 and 22. Part 22 has a flat-bottomed recess 23 to receive the set screw so that the tool element will not have a tendency to turn. Ends 21 are formed each with a semi-cylindrical jaw element 24 internally serrated or formed with teeth 24a to engage therebetween an object to be extracted—such for instance as a bullet or the like. Other types of tools may also be used with my handle, and it will be noted that effective leverage is provided.

In describing the operation of my pliers, it is to be noted that in order to fully complete the circuit to the lamp bulb, not only must contact stud 10 engage the uninsulated part of battery 6, but the jaws 24 of tool elements 19 must grip a metallic object therebetween. Therefore, my pliers are used in probing and exploring for a bullet, or the like, and I have found that upon contact, the lamp will usually flicker as a preparatory signal, and when the bullet, or other metallic object is firmly grasped between the jaws, the circuit is fully completed and the bulb 13 energized not only to function as a signal, but to facilitate manipulation of the pliers to remove the bullet.

While it is believed that the operation and advantages of my invention will be apparent from the foregoing, it is emphasized that my instrument is compact and sturdy, and practical and efficient for the purposes intended. Interpretation of the scope of my invention should only be conclusive when made in the light of the subjoined claims.

I claim:

1. A surgical implement comprising handle portions formed with elongated compartments therein, means for closing the ends of said compartments, a battery and a light bulb carried in one compartment, and an opening in the end wall of the said one compartment through which the rays of the bulb are projected forwardly of the handles, said handles having pivoted cross shanks fully insulated from each other, a spring between the handles, an opening in the battery carrying compartment, a stud on the spring extending through said opening to contact the battery when the handles are brought together and tool elements removably attached to the shanks of the handle elements so that when contact is completed on a metallic object by the tool elements, the circuit is completed to the light bulb.

2. A tool handle, comprising pivoted crossed shanks fully insulated from each other and having bores in the ends thereof, tool elements in said bores and thumb screws to lock the same therein, said handle elements being formed with cylindrical compartments longitudinally of the handle elements, screwthreaded closures for the compartments, one compartment having an opening directed toward the shanks, a battery in said latter compartment, a bulb carried in said compartment and directed toward the opening therein to illuminate the tool elements fixed to the shanks, and a spring device for the handles

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having a contact pin for engaging the battery thereby to complete the electric circuit to the bulb when a metallic object is grasped by the tool elements.

3. The invention as described in claim 1, comprising elongated, parallel handles the exterior parts of which are contoured to fit the fingers, shank portions crossed in advance of the handles and fully insulated from each other, a pivoting screw for holding the shanks together, and a reduced tool engaging portion on each shank.

4. The invention as described in claim 1, comprising tool elements in the shanks, each having an elongated portion and outwardly bent ends, and the free end of each tool element having an internally serrated or toothed semi-circular gripping jaw.

5. A surgical instrument comprising a pair of handles having the exterior thereof contoured for manual engagement, one of said handles having interiorly thereof a cylindrical compartment, a battery therein, an insulating bushing closing one end of said compartment, a signal bulb secured in said bushing and contacting an end of said battery, a threaded cap member closing the other end of said compartment, one of said handles having an aperture through its side wall communicating with said compartment and registering with said battery shanks secured to the ends of said handles, said shanks overlying and crossing each other, a pivot member, an insulating annular bushing thereon extending through said shanks, insulating washers on said annular bushing insulating said shanks from each other and from said pivot pin, a substantially U-shaped spring element between said handles tending to separate the same about said pivot pin, means fastening one leg of said spring element to one of said handles, a stud secured to the free end of the other leg of said spring element and projecting through, but spaced from the walls of, said aperture and adapted to contact said battery whereby said U-shaped spring becomes a conductor of current, tool elements secured to said shanks, and gripping portions forming the terminal ends of said tool elements and adapted to engage and clamp a metallic object whereby an electrical current from the battery through the handles and tool elements will be completed to illuminate said signal bulb.

SAMUEL BROWN SMITH.

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