June 30, 1931. D. E. ROBERTS 1,812,608

ELECTRO SURGICAL INSTRUMENT AND CONTROL

Filed Oct. 24, 1929

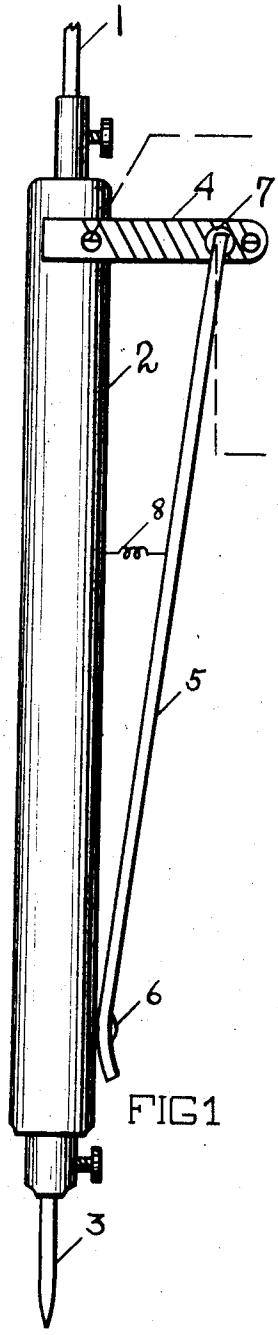


FIG1

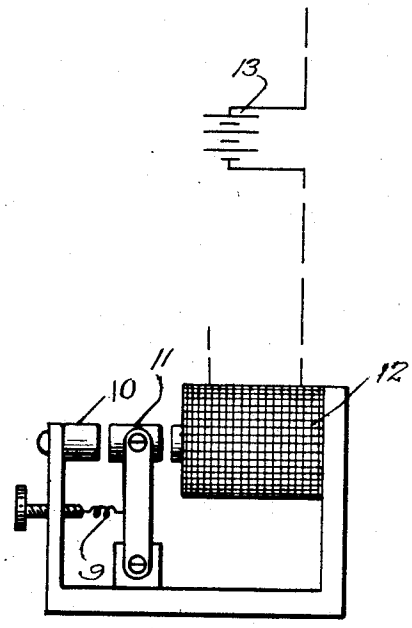


FIG 2

INVENTOR

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UNITED STATES PATENT OFFICE

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ELECTRO-SURGICAL INSTRUMENT AND CONTROL

Application filed October 24, 1929. Serial No. 402,137.

The invention relates to an improvement in electro-surgical instruments and their controls and the object of the improvement is to allow the operating surgeon to control with his operating hand the amount of current flowing to the cutting or piercing instrument.

One form of the invention is illustrated in the accompanying drawings in which Figure 1 is an electro-surgical instrument and Figure 2 is a magnetically operated spark-gap.

1, Figure 1, is the feed wire to the instrument carrying a high frequency current through the insulated handle 2, Figure 1, to the cutting or piercing instrument 3, Figure 1.

4, Figure 1, is a rheostat, the resistance of which is lessened by pressing insulated arm, 5, Figure 1, which is hinged at 6, Figure 1, and carries a wiping contact 7, Figure 1. The insulated arm 5, Figure 1, is returned to the position of full resistance of the rheostat 4, Figure 1, by spring 8, Figure 1.

1 and 2, Figure 2, are the spark-gap points of a high-frequency machine which delivers the current for electro-surgery, but as no patent is claimed on such a machine, it is not included in these specifications.

The amount of current to electro-magnet 3, Figure 2, from battery 4, Figure 2, is controlled by rheostat 4, Figure 1, as shown wired by broken lines between Figures 1 and 2.

To operate this electro-surgical instrument, the cutting or piercing point 3, Figure 1, is placed, then the insulated arm 5, Figure 1, is pressed, lowering resistance of rheostat 4, Figure 1, causing electro-magnet 3, Figure 2, to attract iron spark-gap point 2, Figure 2, opening gap between spark-gap points 1 and 2, Figure 2; the tension of spring 5, Figure 2, keeps spark-gap points 1 and 2, Figure 2, closed when the insulated arm 5, Figure 1, is not pressed.

Prior to this invention, the current to electro-surgical instruments was controlled by setting the spark-gap open then closing a foot-switch which would allow the current to flow to the patient at full strength; or, the current was controlled by an assistant, who, after the cutting or piercing instrument was in place, would open the spark-gap by means of a rod or screw.

With the instrument described in these specifications, the surgeon can smoothly control the current to the cutting or piercing instrument with his operating hand, leaving one hand free, and not requiring an assistant or oral instructions to an assistant.

Due to the varying sizes of electro-surgical instruments, no sizes are given; the experimental model being ten inches long. It is to be understood that the idea of the invention is to place the control of current to the cutting instrument in the surgeon's operating hand; therefore, the electro-magnet 12, Figure 2, may control a magnetically operated rheostat in place of the spark-gap illustrated; the spark-gap only is shown for simplicity of illustration.

I am aware that prior to my invention, rheostats have been used to operate electro-magnets and magnets have been used to open spark-gaps. It is also understood that I make no patent claims on the surgical instrument holder illustrated in the accompanying drawings.

I claim:

An electro-surgical instrument and control consisting of a suitable instrument handle to which is hinged an insulated arm carrying a wiping contact which slides in contact with a rheostat which is secured approximately at right angles to the instrument handle, in combination with a magnetically operated spark-gap; and operated by manual pressure of the surgeon's operating hand pressing upon the insulated arm of the rheostat, thereby opening the spark-gap, allowing current to flow to the operating instrument.

DONALD E. ROBERTS.