

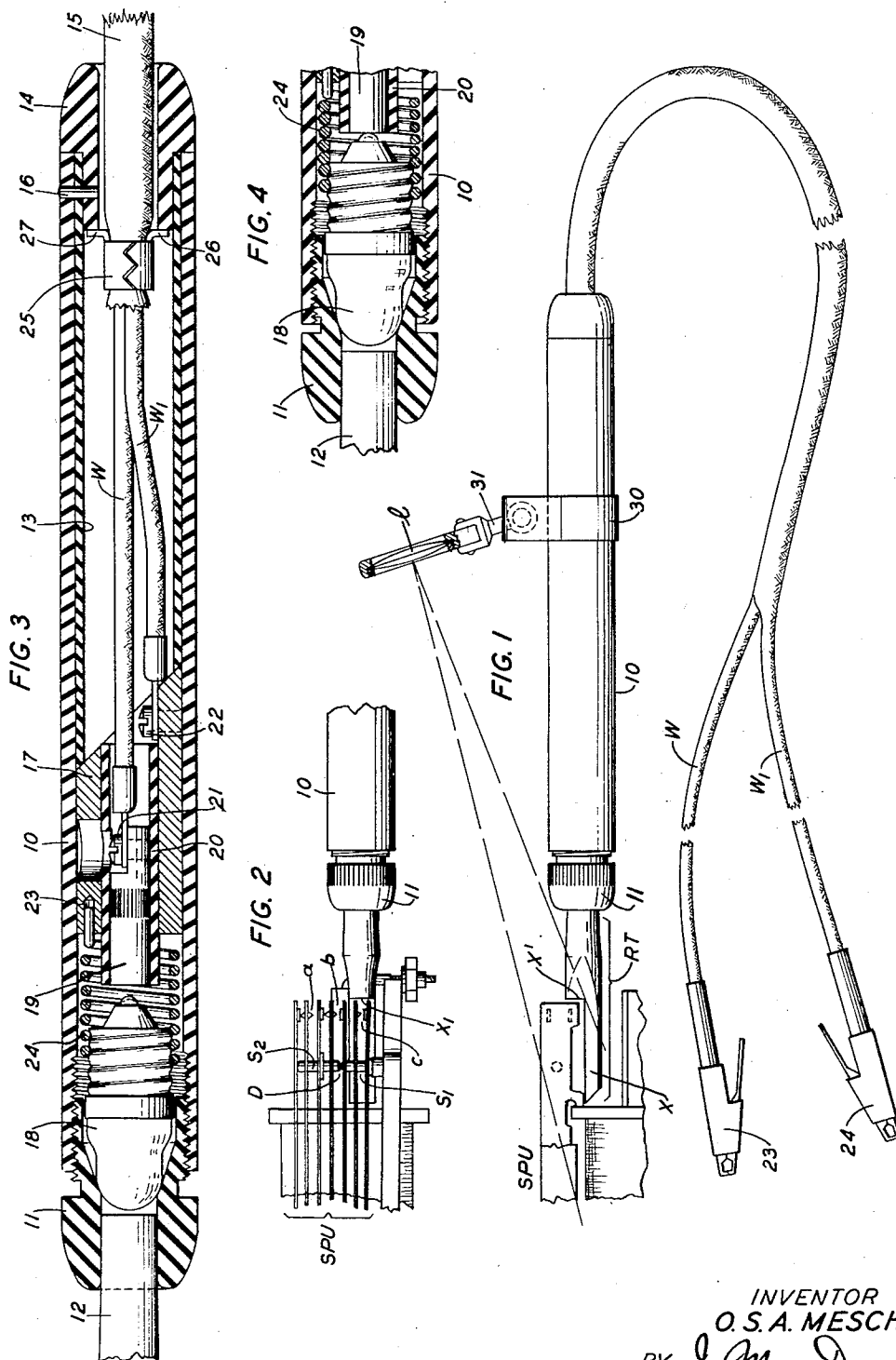
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TEST LAMP

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TEST LAMP

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1 Claim. (Cl. 240—2.18)

This invention relates to contact spring viewing devices and has for its object the provision of a contact spring viewing device which will be simple and convenient in use.

In manual and automatic telephone systems, for example, as is well known, a great number of motor magnets are used for operating switching elements in the form of contact springs upon the movement of their armatures for effecting circuit connections, the contact springs being actuated in sets of varying numbers through insulating studs carried by some of the springs and placed in an end-to-end relation adjacent the cooperating contacts at the free ends of these springs.

In such switch spring assemblies, due to the extremely limited space available on the frames on which these motor magnets and associated contact springs are mounted, together with the space taken by their connecting wires, visual observations and adjustments of the contacts and the gaps between the insulating studs operatively interconnecting these contact springs is rendered inconvenient and difficult, especially when considering that the air-gaps or clearance between the insulating studs must be maintained within a few thousandths of an inch, in order to assure proper operation of the contacts and consequently the proper operation of the electrical apparatus controlled by the operation of such switch springs.

According to this invention, a contact spring viewing device is provided in which the light emitted by an electric bulb illuminates a tip of light conducting material from which the light is deflected toward the spaces or gaps between the studs and the contacts which are amplified by a lens clamped on the handle on which the light conducting tip is secured. Means is provided for adjustably positioning the lens relative to the tip, the contacts and their actuating studs for visually observing them. Means is provided whereby the turning movement of a knob relative to the handle controls the energization of the lamp, with means provided for effecting electrical connections between the elements connecting with the electrodes of the lamp and the incoming wires, such connecting wires being encased in the handle which supports the means for controlling the operation of the lamp.

Other novel features of the invention and advantages will appear from the following description and by the claim appended thereto, reference being had to the accompanying drawing in which:

Fig. 1 is an assembly view showing the reflector tip in position for viewing a contact spring assembly;

Fig. 2 is a partial view showing the reflector tip and the spring assembly 90 degrees from the position shown in Fig. 1;

Fig. 3 is an enlarged longitudinal sectional view showing the lamp out of contact from its associated centrally disposed conducting element; and

Fig. 4 is a partial view in section showing one of the electrodes of the lamp in contact with the centrally disposed conducting element.

In the drawing, 10 is a tubular housing made of insulating material. This housing at one of its ends is interiorly screw threaded for receiving a similarly screw threaded knob 11 having a longitudinal centrally disposed opening for receiving the stem portion 12 of a light conducting tip RT the function of which will be hereinafter described in detail.

A tubing 13 of insulating material fits into the tubular housing 10 and in the end of this tubing is inserted the reduced portion of a plug 14 of insulating material. This plug has a longitudinal central opening provided for receiving the electric cord 15 having the wires W and W1, shown in Figs. 1 and 3. The housing 10, the tubing 13 and the plug 14 are held against movement relative to each other by a radially disposed pin 16 shown in Fig. 3. The opposite end of tubing 13 is formed obliquely relative to its length for registering with the obliquely shaped end of a conducting sleeve 17. A conducting core 19 is mounted in sleeve 20 of insulating material in turn fitting the interior of conducting sleeve 17. The sleeve 17 and the insulating sleeve 20 are provided with registering openings for permitting the passing of a screw 21 threadedly engaging with a similarly threaded hole in the rear end of core 19, this screw serving for securing the wire W of cord 15 to the core or conducting element 19 while the wire W1 of cord 15 is secured to the metallic sleeve 17 by a screw 22 as shown in Fig. 3.

The metallic sleeve 17 is provided with a hole 23 shown in Figs. 3 and 4 for receiving one end of a conducting helical spring 24, the other end of this spring engaging the screw-threaded electrode of lamp 18. The spring 24 is normally tensioned, as to force the lamp 18 out of contact from the core 19 upon the unscrewing of knob 11 and electrically connects the sleeve 17 to the screw-threaded electrode of bulb 18.

The tip RT which may be made of any light

conducting material, has a portion X of rectangular cross-section forming a shoulder portion at X1 provided for assisting in locating its reflector end in position relative to the contact spring assembly or pile-up. The wires W and W1 of cord 15 terminate at their opposite ends in clips 23 and 24 provided for securely connecting the electrical bulb to any current source (not shown), while a fastening ring 25, which is clamped over the cord 15, is provided with lug portions 26 and 27 abutting against the end of insulating plug 14 for resisting any pull on the cord 15 and thereby preventing the breaking of the connections at the end of wires W and W1. A spring clip 30 shown in Fig. 1 engages the handle 10 and cooperates with the link 31 to form a swivel device for focusing the lens L on the studs S1 and S2 and onto the contacts a, b and c at the free end of the contact spring assembly or pile-up SPU.

20 In the use of this device for the visual observation of the contact spring pile-up shown in Figs. 1 and 2 for example, the knob 11 is screwed in the tubular housing 10 in position wherein the central electrode of the bulb engages the end core 25 19 to establish an energizing circuit for the electric bulb 18 through the wire W, the core 19 in contacting engagement with the centrally disposed electrode of the bulb, the other side of the circuit extending through wire W1, the conducting sleeve 17 and the helical spring 24 screwing on the other electrodes of bulb 18.

The light emitted by the bulb 18 passes through the tip end RT and lights the rear sides of the contact springs passing unobstructed between the 35 gaps of contacts a, b and c and through the clear-

ance D between the studs S1 and S2, which are visually observed and amplified by the lens L mounted on the swivel device carried by the handle, thus facilitating the viewing and adjustment of the contacts.

It is understood that minor changes may be made in the device of this invention without departing from the scope of the appended claim.

What is claimed is:

A device of the character above described, comprising a tubular handle of insulating material, a sleeve of conducting material, a sleeve of insulating material disposed in end-to-end relation with said conducting sleeve and secured to said handle, a sleeve of insulating material disposed in concentric relation in said conducting sleeve, a core in the last-mentioned sleeve, said core and said conducting sleeve having means for connection with the ends of incoming electrical wires, a lamp in said handle, a helical spring having one of its ends engaging one electrode of said lamp and its other end engaging said conducting sleeve for electrically connecting said conducting sleeve to said electrode and normally holding the other electrode of said lamp disengaged from the adjacent end of said core, a knob adjustable longitudinally of said handle for moving said lamp against the tension of said spring in engaged relation with said core for energizing said lamp, said second-mentioned sleeve and said conducting sleeve having registering portions held inter-engaged by the tension of said spring, and a light conducting element carried by said knob.

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