

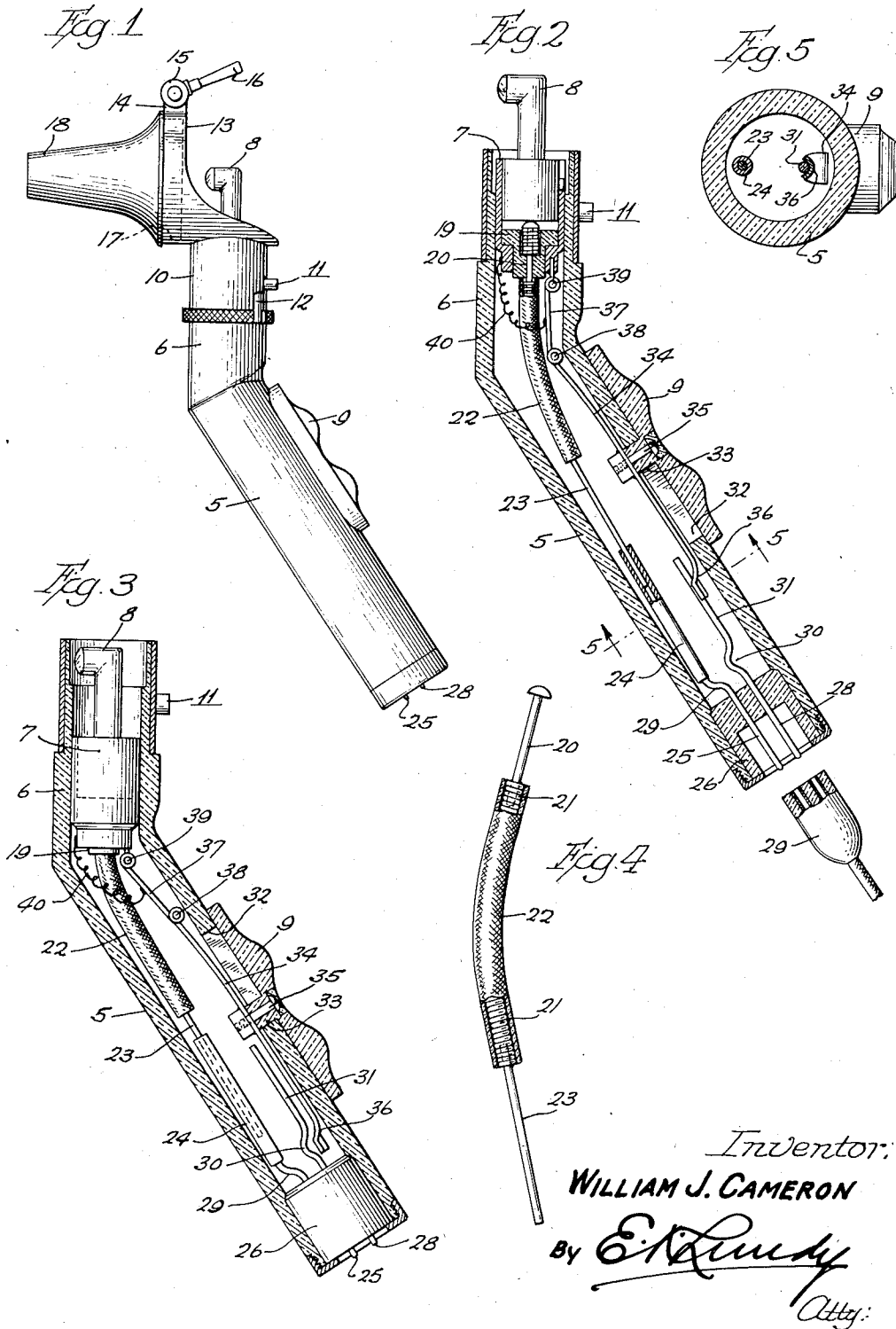
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HANDLE FOR INSTRUMENTS

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## UNITED STATES PATENT OFFICE

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## HANDLE FOR INSTRUMENTS

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6 Claims. (Cl. 128—9)

In a prior United States Letters Patent No. 1,793,463, issued to me February 24th, 1931, I have disclosed a handle for mounting and supporting various types of instruments and illuminating the area under inspection. Although the structure is therein illustrated in combination with optical instruments such as ophthalmoscopes or retinoscopes, such handle is readily and well adapted for and is used in connection with nasal and aural specula and other surgical instruments as shown, for example, in my United States Letters Patent No. 1,896,861 of February 7th, 1933 and No. 1,934,698 of November 14th, 1933. It will be noted, in all these types of instruments that the lower major portion of the handle, which is the part that is held by the hand of the operator, is axially aligned with the upper portion of the handle that receives or cooperates with the particular instrument mounted thereon and which carries the illuminating bulb. Obviously the operator's fingers, surrounding and grasping the lower "grip" portion of the handle, will be close to and is often in actual contact with the portion of the patient's body which is adjacent the part or tissue being operated upon or under examination. This has been found to be very undesirable and especially with certain types of patients.

I have devised the herein disclosed structure for the purpose of providing a novel handle, for mounting optical, surgical and dental instruments, that has the axis of its grip portion disposed oblique to the axis of its instrument-mounting portion, and also providing in connection therewith a novel switch and electric conductor arrangement for controlling the illuminating lamp at the instrument receiving end of the handle. By this arrangement the operator may grasp the handle with his hand in any manner convenient to himself and then use the instrument without touching the patient's body near the part being inspected.

Because of the fact that the axis of the hollow shell of the handle is irregular or angular in shape, being formed with two oblique portions, and also because it is desirable to retract the lamp or bulb into the instrument receiving end of the handle, I have designed a novel switch mechanism and novel arrangement of conductors within the shell that insures effective performance of the functions required of these parts and permits the installation of such parts within the restricted space inside the handle shell. Such construction and arrangement permits the simultaneous operation of the switch and the

movement of the lamp by a single operation by the user, and it also utilizes a common element for performing these functions.

My present invention has numerous other objects in view, among which may be mentioned the provision of a handle of the character described that is dependable in use; may be manipulated with facility; is novel in construction; is simple in the arrangement or disposition of its parts so that it will not readily become inoperative; and which is economical to manufacture so that it may be sold to the user for a reasonable retail price. Further objects and advantages will be apparent to persons skilled in the art after my invention is understood from the following description.

I prefer to practice my invention and to accomplish the numerous objects thereof by means of the structure herein disclosed and which is more particularly pointed out in the appended claims.

Reference is herein made to the accompanying drawing that forms a part of this specification.

In the drawing:—

Figure 1 is a vertical side elevation of my improved handle showing a universal instrument-head mounted thereon and a nasal or aural speculum clamped in said instrument head.

Figure 2 is a longitudinal axial section of the handle, the head and instrument being omitted, with the switch elements in closed position and the bulb projected.

Figure 3 is a section similar to Fig. 2 showing the relative positions of the parts when the switch is opened and the bulb retracted.

Figure 4 is a fragmentary detail, partly in section of one of the electric conductors.

Figure 5 is a transverse section on line 5—5 of Figure 2.

The drawing is schematic for the purpose of disclosing a typical or preferred embodiment of my improved handle structure, and in said drawing like reference characters are used in the different views to designate like parts wherever they appear.

By reference to Figure 1, it will be seen the handle is a terete or is cylindrical in transverse section, the lower or major portion 5 of which is of a length sufficient to provide a ready grasp when taken in the hand by the user, and it is hollow in order to provide a housing for electric conductors and the elements of an electric switch. The upper end portion 6 is also a terete or is cylindrical in transverse section and has its axis disposed oblique to the axis of the lower major portion 5 as seen in the different views. This upper

end portion 6 is hollow, so that it forms an oblique continuation of the lower portion. The interior of the upper portion of the handle provides a guide for a slidable electric socket 7 that carries a light bulb 8 which may be retracted into the end of the handle or may be projected beyond the latter by reciprocating a slide 9 on the exterior of the handle by the operator's thumb. These two portions of the handle are made from insulating material, and are preferably a molded hard rubber or a molded phenolic condensation product so that one continuous or unitary hollow piece is provided.

The means for mounting an instrument on the handle is in the form of a universal head consisting of a short tubular base or band 10 that is telescoped upon the upper end 6 and is removably secured in position by means of a pin 11 and bayonet slot 12, and, at one side of the axis of the tubular base there is a split band or ring 13 that surrounds the adjacent cylindrical-shaped end portion of the instrument. The adjacent ends of the band or ring terminate in lateral ears 14 that are moved towards and from each other by means of a rotatable cam block 15 that is positioned between them and is actuated by a laterally and radially projecting lever 16.

The split band or ring is of sufficient dimensions to readily receive the cylindrical-shaped rear flange or sleeve portion 17 of a speculum 18, and when the cam 15 is rotated this band will become constricted around the sleeve and will firmly hold the speculum, tool or other instrument in position. When an optical instrument such as an ophthalmoscope, retinoscope, etc., is used with the handle the tubular base 10 may be made as a part of such instrument and the clamping band is not needed and the lamp is of a different pattern.

The lamp socket 7 is a metal shell of a diameter to slidably fit into the upper end portion 6 of the handle and an insulating block 19 is secured in its inner end through which a centrally disposed electric terminal 20 passes. At its inner end this terminal is connected to the adjacent end of a flexible hollow conductor 21 that is made from a spirally coiled or wound wire, shown in detail in Figure 4, which wire coil is surrounded by a flexible protecting sheath 22 of suitable insulating material. The end of the flexible conductor 21 that is remote from the block 19 is attached (preferably by soldering or brazing) to a stiff rod 23 of conducting metal that enters and slides in a small tube 24 also of conducting metal.

An electric terminal wire 25 passes through and projects from both sides of an insulating disk-like block 26 mounted within the handle member 5 back of the lower end of the latter, the inwardly projecting portion of the terminal being given a shouldered or S-shaped off-set bend 29 and secured to the adjacent lower end of the conductor tube 24. This terminal wire 25 is stiff and tightly fits the disk-like block 26 so that a solid mounting is provided for the stationary tubular conductor 24.

A second terminal wire 28 passes through the block 26 with its longer portion disposed within the handle member 5 and having its outer portion projecting into the space between the outer face of the block and the adjacent end of the handle member 5. Thus a suitable electric connector socket is provided at the lower end of the handle for making electric connection through the medium of an electric plug element 29 with a source of current supply. Within the handle and back of the block 26 there is a "break" formed

in said wire 28 by giving it a hump-shaped bend 30, while beyond this bend the wire 28 extends upwardly to near the center of length of the handle grip member 5 so that it is disposed adjacent and parallel with the wall of the handle member to provide a straight contact element 31 that cooperates with a movable member of the switch.

The slide 9 hereinbefore mentioned is positioned over an elongated slot 32 in the wall of the handle so that the slide may be moved longitudinally on the handle within the limits of said slot and such movement is controlled by a lug 33 extending from the slide through the slot to a flat metal strip 34. The slide 9 and the lateral lug 33 that engages in the guide-slot are preferably formed integrally from a piece of insulating material such as hard rubber or a phenolic condensation product. Connection is made between the slide and the strip by a screw 35 the head of which is screwed in below the surface of the slide and then covered with insulating material, while its shank enters a threaded boss on strip 34.

The bar 34 is one of the elements of an articulated conductor, and at its lower end the bar is curved inwardly as at 36 towards the axis of the handle to slidably engage the contact element 31 above mentioned. As shown in Fig. 5, the curved end portion 36 of the bar is formed concavo-convex so that the portion thereof that engages and slides on the contact 31 will partly surround the latter and insure positive electrical engagement therewith whenever the switch is in an "on" position and the circuit closed.

The other or upper end of the bar 34 is flexibly and movably connected with a short conductor link or bar 37 by an articulation in the form of a hinge 38, and said short conductor link or bar 37 is likewise flexibly and movably connected by an articulation or hinge 39 with the shell of the lamp socket 7. The terminal wire 28 including the straight contact element 31, the long bar 34, the short link bar 37, and the hinged articulations 38 and 39 are fabricated from suitable metal capable of effectively conducting electric current. In order to positively insure conduction of current a flexible "jump" wire 40 is preferably connected at its ends respectively to the socket shell 7 and the short link bar 37. The other side of this circuit through the lamp is formed by the central lamp socket terminal 20, the flexible conductor 21, the rod 23 slidably telescoping with the tubular conductor 24 and the lower terminal 25.

When the parts of the structure are in the relative positions shown in Figure 2 the circuit is closed through the lamp 8 and the latter is illuminated and is protruding from the end of the handle. Upon moving the slide-piece 9 downwardly on the handle to the other end of slot 32, the curved end 36 of conductor bar 34 (which had previously engaged the straight portion 31 of the conductor terminal 28) will be moved off said straight portion and will be positioned free in the space alongside the bend 30, thus breaking contact and opening the circuit, as illustrated in Figure 3. In this latter position of the elements the circuit is broken and the lamp is extinguished and will be retracted into the adjacent end of the handle. On account of the articulations 38 and 39 as well as the flexibility of the spiral conductor 21 and the telescopic coaction between rod 23 and the tube 24, these composite conductors that form the circuit from the connector termi-

nals 25 and 28 through the socket shell and lamp, are readily moved longitudinally in the hollow handle 5—6 and around the angle formed at the juncture between the two obliquely disposed portions of the handle.

It will be noted the lamp will remain lit, although being retracted into the handle, until such time as the bowed end portion 36 of the movable conductor strip is moved out of contact with its coacting contact element 31 and has been disposed free in the recess formed by the bend 30 in said contact element. This permits the lamp to be moved to a position where it will not interfere with instruments inserted in the speculum to operate upon the tissue and will continue to illuminate the cavity during the performance of the operation, and will also permit up and down movement of the lamp with relation to an ophthalmoscope or retinoscope for the purpose of focusing the light with respect to the optical elements of such instruments.

What I claim is:—

1. An illuminating handle for instruments comprising a hollow body portion and a hollow extension at one end thereof, the longitudinal axis of said extension intersecting the longitudinal axis of said body portion, a lamp and socket reciprocally mounted in said extension end portion, a pair of terminals at the other end of said body, means within said body for forming one side of an electric circuit through said socket and lamp consisting of a telescopic rod and tube extending between said socket and one of said terminals and disposed within said body, means for forming the other side of the electric circuit consisting of a spiral conductor and a mobile conductor structure extending between said socket and the other of said terminals, and a device cooperating with one of said circuit-forming means, which device is movable to a position to separate certain elements of said circuit-forming means to break the circuit.

2. A device of the kind described comprising a hollow body having an oblique end portion, a socket and lamp mounted for reciprocal movement in said oblique portion, a pair of terminals at the other end of said body, a conductor forming electrical connection between said socket and one of said terminals, an extension on the other terminal, a plurality of articulated mobile conductor elements one of which is secured to said socket and the other of which is adapted for slidable contact with the terminal extension, and a slide connected to one of said articulated elements for moving said elements and said socket longitudinally in the respective portions of said body, whereby the contacting conductor element is adapted to be moved to a non-contacting position with respect to its terminal.

3. A device of the kind described comprising a hollow body having an oblique end portion, a socket and lamp mounted for reciprocal movement in said oblique portion, a pair of terminals at the other end of said body, a conductor forming electrical connection between said socket and one of said terminals, an extension on the other terminal having an off-set portion, a plurality of articulated mobile conductor elements one of

which is secured to said socket, and a slide connected to one of said articulated elements for moving said elements and said socket longitudinally in the respective portions of said body, one of said articulated elements slidably contacting said terminal extension and adapted to be moved by said slide to a position where its contact forming portion is out of engagement with its terminal at said off-set portion.

4. An illuminating handle for instruments comprising a hollow body portion, a hollow extension portion at one end thereof with its longitudinal axis intersecting the longitudinal axis of said body portion, a lamp and socket reciprocally mounted in said extension portion, a pair of terminals in the other end of said handle, a conductor electrically connecting said socket and one of said terminals and having a flexible portion extending through the angle formed by said body and extension, a movable finger engaging member accessible from the outside of said handle, an articulated conductor operatively connecting said finger member to said socket, said last-named conductor having a portion movably contacting the other terminal, said last-named terminal having a laterally off-set gap into which the contactable portion of the coacting conductor is moved by said slide to break the circuit to the socket.

5. An illuminating handle for instruments comprising a hollow body portion and a hollow extension portion at one end thereof, the longitudinal axis of said extension intersecting the longitudinal axis of said body portion, a reciprocal socket and lamp movable longitudinally in said extension, spaced terminals at the other end of said handle, a conductor electrically connecting one of said terminals to said socket, a conductor slidably engageable at one end with the other terminal and connected at its other end to said socket, an articulation formed in said slidable conductor adjacent the angle formed by said handle body and extension, means for moving said slidable conductor to project and retract said lamp with respect to said extension, and means for disconnecting said sliding conductor from contact with its terminal.

6. An illuminating handle for instruments comprising a hollow body portion and a hollow extension portion at one end thereof, the longitudinal axis of said extension intersecting the longitudinal axis of said body portion, a socket and lamp reciprocally mounted in said extension portion, a pair of terminals at the other end of said body, means forming electrical connection between said socket and one of said terminals, a conductor connected to and extending from said socket, a second conductor extending from the first conductor into sliding contact with the other terminal in circuit-forming position, a pivotal connection between the proximate ends of said conductors permitting movement of the last said conductors past the angle formed by the body and its extension end, and means for moving the second conductor out of engagement with its terminal whereby the circuit is broken and said socket is retracted in the extension end portion of said body.

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