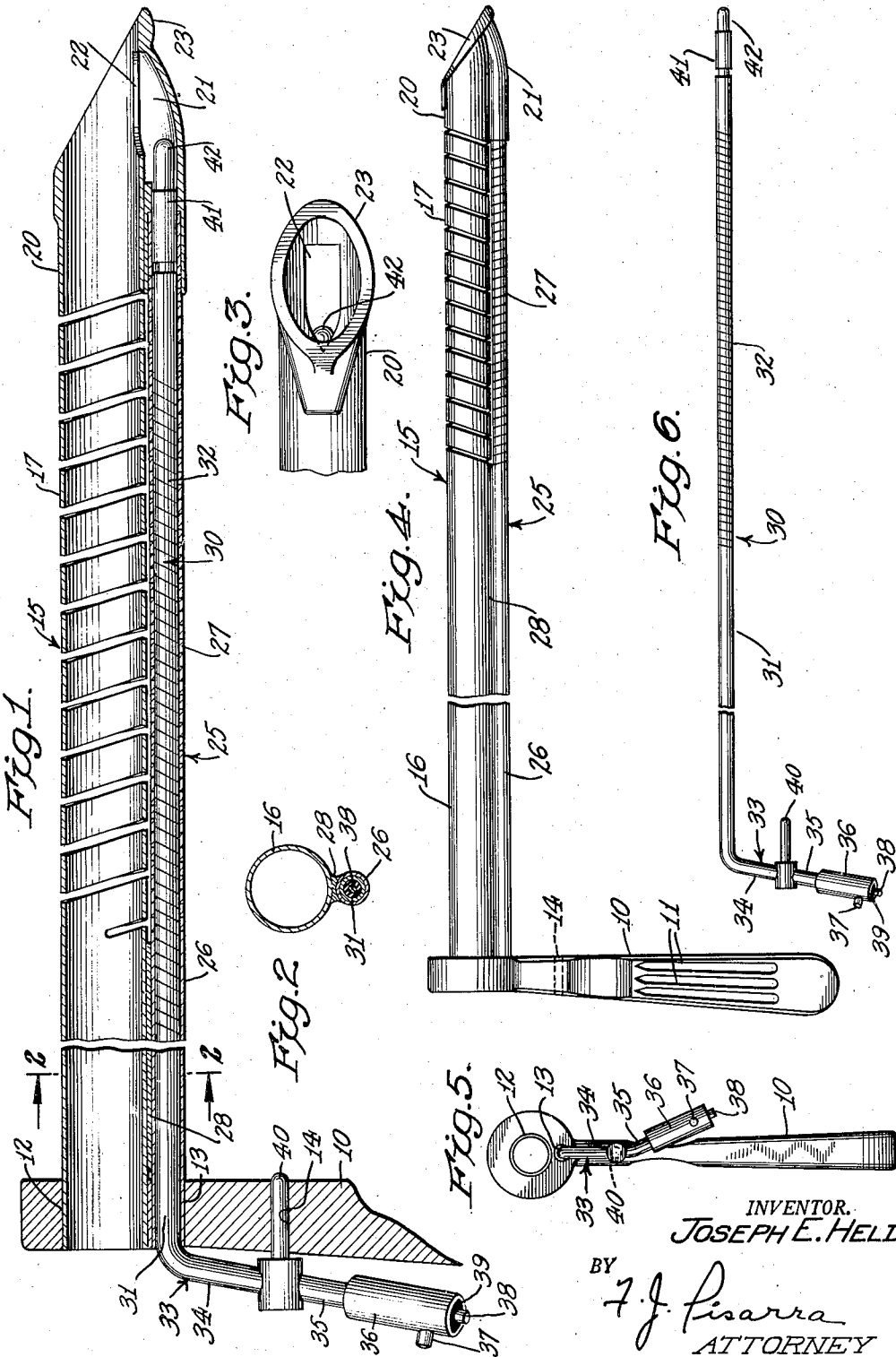


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EXAMINING INSTRUMENT
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EXAMINING INSTRUMENT

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1 Claim. (Cl. 128-6)

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This invention relates to an examining instrument, and more particularly to an instrument that may be readily introduced into and removed from tortuous body cavities or passages for the purpose of permitting the ready examination of the walls of such passages under conditions of illuminated vision.

An instrument constructed in accordance with this invention may be advantageously employed for examination and diagnosis of the pharynx and the esophagus. As will be apparent to persons skilled in the art, the instrument is adapted to be readily used for purposes of examination and diagnosis in connection with other body passages as well.

Instruments of this type that have been generally used by the medical profession heretofore have been rigid in construction. Despite the extreme care exercised by the operator in introducing a conventional instrument of this type into the esophagus, the patient is almost invariably subjected to considerable discomfort and pain and to severe shock. Also, the delicate membranes of the pharynx and esophagus which come in contact with the non-yielding surfaces of the instrument become irritated and injured with consequent damage to the health of the patient.

The instrument of this invention eliminates to a substantial degree the objections referred to above in that by virtue of its flexible construction, the introduction of the instrument into a body passage, such as the esophagus, may be facilitated. It has been ascertained that my examining instrument may be readily manipulated and inserted through the mouth of the patient and thence into the usually distorted passages of the esophagus and still permit of examination.

It is the primary object of this invention to provide an examining instrument that may be readily introduced into a body passage, such as the esophagus, with a minimum of pain and shock to the patient and damage to the membranes constituting the walls of the passage.

An important object of the invention is to provide an instrument of the character indicated which permits of the ready examination of body passages under conditions of illuminated vision.

Another important object of the invention is to provide an examining instrument possessing characteristics of flexibility which permit of its ready insertion into and removal from distorted or tortuous body passages.

The invention has for a further object the provision of an examining instrument that is capable of being readily manipulated and successfully

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employed under a relatively wide range of conditions.

With the above and other objects in view, the invention comprises the devices, combinations and arrangements of parts set forth in the following detailed description and illustrated in the annexed drawing of a preferred embodiment of the invention, from which the several features of the invention, together with the advantages attainable thereby, will be readily understood by persons skilled in the art.

In the drawing:

Figure 1 is a central longitudinal cross-sectional view through an instrument constructed in accordance with the invention, with parts broken away and other parts omitted;

Figure 2 is a cross-sectional view taken along line 2-2 of Figure 1;

Figure 3 is a top plan view of the forward end of the instrument illustrated in Figure 1;

Figure 4 is a side elevational view, with parts broken away, of the instrument of Figure 1 with the means for supplying illumination removed;

Figure 5 is an elevational view of the instrument of Figure 4, as viewed from the left thereof, and illustrating the means for supplying illumination operatively associated therewith; and

Figure 6 is a side elevational view, with parts broken away, of the means for supplying illumination to the instrument illustrated in Figure 4.

Referring now to the drawing wherein like reference characters denote corresponding parts throughout the several views, the instrument illustrated therein includes a handle or grip 10 that is fluted, as indicated at 11, whereby the instrument may be securely grasped and manipulated. Handle 10 is bored to obtain a pair of adjacent tube-receiving openings 12 and 13 and a third through opening 14 for receiving an aligning pin that will be described further along herein.

An examining tubular member 15 includes a rigid rearward end portion 16 and a flexible forward end portion 17. As is shown, flexibility is attained in portion 17 by virtue of its generally helical configuration. Also, as is shown, flexible portion 17 may constitute an extension of rigid portion 16 but, if desired, may be a separate tubular element appropriately joined to rigid portion 16. The rearward end of portion 16 terminates in opening 12 in handle 10 and is attached to the handle in any manner known to the art. A hollow tip element 20 constitutes the free end of flexible portion 17 and is provided with a compartment 21 that serves as a lamp housing

A passage 22 establishes light communication between compartment 21 and flexible portion 17. The end of tip 20 is rounded, as indicated at 23, to prevent injury to membranes or body tissues with which it may come in contact. Additionally, tip 20 terminates in a plane that is inclined to the normal axis of tubular member 15 to facilitate the insertion of the instrument into distorted body passages.

Portions 16 and 17 of tubular member 15 are normally substantially coaxial, as shown in Figures 1 and 4, but by virtue of the flexible construction above described, the forward portion of tubular member 15 may be flexed when in use to accommodate itself to bends in the pharynx, esophagus or other body passages, as required. Also, tubular member 15 is of such cross-section area as to be received in a body passage without undue discomfort to the patient while permitting the operator to examine the walls of the passage by looking through the rear end of tubular member 15.

A second tubular member or light carrier tube 25, consisting of a rigid rearward end portion 26 and a flexible forward end portion 27, is positioned directly beneath tubular member 15. The rearward end of portion 26 is disposed within opening 13 in handle 10, while the forward end of flexible portion 27 extends into compartment 21 of tip 20. Tubular members 15 and 25 are maintained in assembled relation by a solder connection 28 (Figures 1 and 3). Portions 26 and 27 of tubular member 25 are also normally coaxial but, as in the case of tubular member 15, may be flexed when the instrument is in use.

Reference is now had to Figures 1, 2, 5 and 6, for details of construction of a light carrier 30 that serves as a means for supplying illumination to the tip end of the instrument. Light carrier 30 includes a tubular sheath comprising a rigid rearward portion 31, a flexible forward portion 32 adapted to be inserted into tubular member 25, and an extension 33 consisting of a downwardly projecting portion 34 and a downwardly and outwardly projecting portion 35. Lower portion 35 carries a hollow contact post 36 having a lock pin 37 for connection with a suitable source of electrical energy (not shown). Within light carrier 30 is an electrical conductor 38 that is maintained in spaced relation to the walls of the carrier by usual insulating material 39. Extension 33 carries an aligning pin 40 adapted to be snugly received in opening 14 of handle 10 when the instrument is fully assembled to thereby maintain light carrier 30 in position. A lamp 41, having a bulb 42, is removably connected to the forward end of flexible portion 32 and is in electrical communication with conductor 38.

It will be apparent from an examination of Figures 1 and 3 that when the instrument is fully assembled, lamp bulb 42 is positioned within compartment 21 and, upon energization of the lamp, light rays emitted therefrom are projected through passage 22 and directed by tip 20 to regions that may be under examination. Also, it will be noted that flexible portions 17, 27 and 32 of tubular members 15, 25 and 30, respectively, are substantially coextensive when the parts are assembled so that the forward portion of the instrument may be readily flexed when in use.

From the foregoing, it is believed that the construction, operation, and advantages of my present invention will be readily comprehended by persons skilled in the art. It is to be clearly understood, however, that various changes in the apparatus set forth above may be made without departing from the scope of the invention, it being intended that all matter contained in the description or shown in the drawing shall be interpreted as illustrative only and not in a limiting sense.

I claim:

In an instrument of the character described, a grip, a first tubular member, a second tubular member secured to said first tubular member and communicating with the interior of the forward end portion of said first tubular member, the axes of said tubular members being substantially parallel, each tubular member comprising a rigid rearward end portion connected to said grip and a flexible forward end portion integral with and constituting a continuation of the rearward end portion, said portions of each tubular member being normally substantially coaxial, and means for supplying illumination to the interior of the forward end portion of said first tubular member, said means including a third tubular member removably disposed in said second tubular member and approximately coextensive therewith, the forward portion of said third tubular member being flexible, an electrical conductor within said third tubular member, and a lamp carried at the forward end of said third tubular member.

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