

May 1, 1962

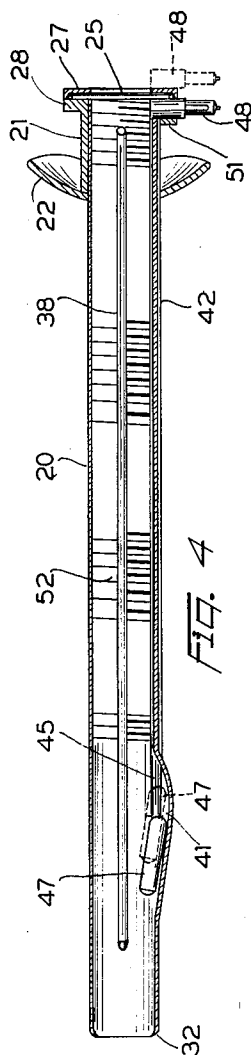
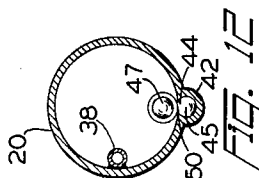
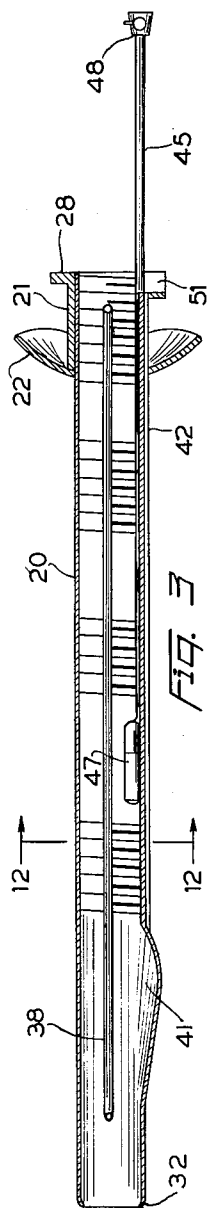
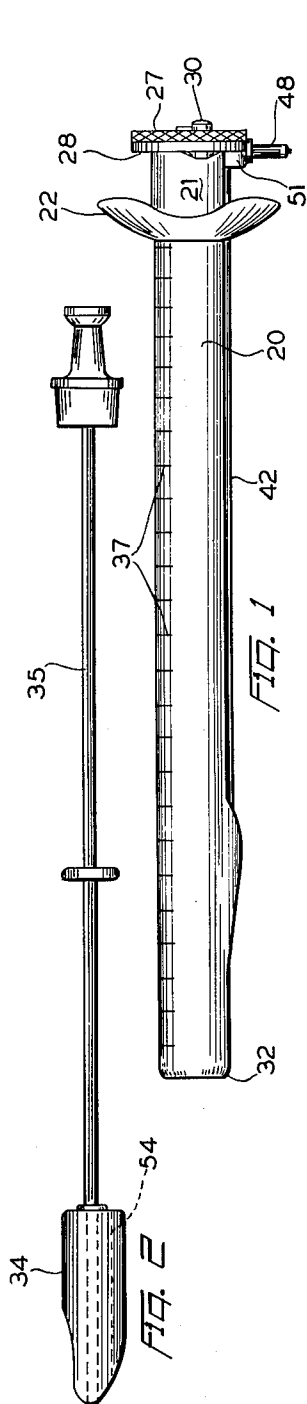
W. C. MOORE

3,032,031

ORIFICIAL INSTRUMENT CONSTRUCTION

Filed June 12, 1958

2 Sheets-Sheet 1



INVENTOR.
WILLIAM C. MOORE

BY

Richard von K. Bums
Att'y.

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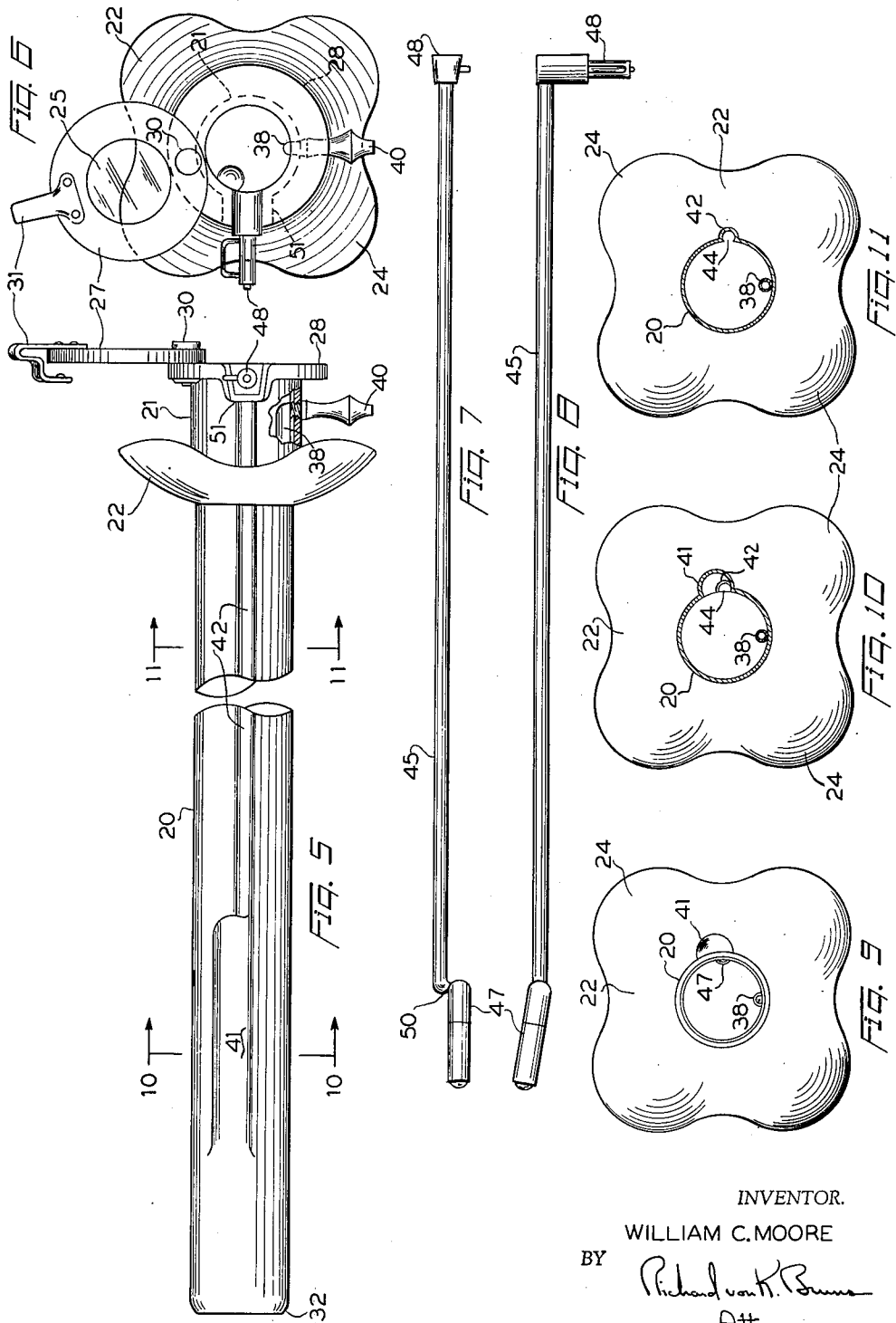
W. C. MOORE

3,032,031

ORIFICAL INSTRUMENT CONSTRUCTION

Filed June 12, 1958

2 Sheets-Sheet 2



INVENTOR.

WILLIAM C. MOORE

BY

Richard van K. Bunn
Att'y

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3,032,031 ORIFICIAL INSTRUMENT CONSTRUCTION

William Clay Moore, 62 E. Elizabeth St.,
Skaneateles, N.Y.

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5 Claims. (Cl. 128-6)

This invention relates generally to medical diagnostic instruments of the class employed for the examination of body cavities, and has special reference to an improved construction for a sigmoidoscope or similar rectal instrument.

The primary object of the invention is to provide an instrument of this type which is constructed so that it permits the use of a larger than conventional illuminating lamp and thus has a higher light output. This provides better illumination for the area being examined and whenever anatomically possible enables a larger area to be observed.

Another important object of the invention is to provide an instrument of the character described wherein the lamp is mounted in the instrument in such a manner that it causes a minimum amount of interference with the viewing passage through the instrument.

A further important object of the invention is to provide an instrument of the character described having a novel means for removably mounting the light assembly in the instrument and for locking it in position therein.

Still another important object of the invention is to provide an instrument of the character described which permits the use of a strong and more durable light assembly than can be fitted into an instrument of conventional construction.

A more specific object of the invention is to provide an instrument of the character described wherein the speculum of the instrument is formed adjacent its distal end with an interior lamp bulb receiving pocket which permits the use of a larger bulb, the outwardly projecting wall of said pocket being smoothly blended into the interior surface of the speculum so that it causes no discomfort to the patient during insertion of the instrument.

Other objects and advantages of the invention will become apparent from the following detailed description thereof read in conjunction with the accompanying drawings which illustrate a representative embodiment of the invention for the purpose of disclosure.

In the drawings:

FIGURE 1 is a side elevation of sigmoidoscope embodying the present invention;

FIGURE 2 is a side elevation of the obturator for the sigmoidoscope of FIGURE 1;

FIGURE 3 is a vertical longitudinal section through the sigmoidoscope of FIGURE 1 showing the manner in which the light assembly is inserted therein;

FIGURE 4 is a sectional view corresponding to FIGURE 3 showing the light assembly in fully engaged position in the sigmoidoscope;

FIGURE 5 is a bottom plan view of the sigmoidoscope of FIGURE 1;

FIGURE 6 is a right end view of the sigmoidoscope as shown in FIGURE 5;

FIGURE 7 is a top plan view of the light assembly;

FIGURE 8 is a side elevation of the light assembly;

FIGURE 9 is a left end view of the sigmoidoscope as shown in FIGURE 5;

FIGURE 10 is a vertical transverse section through the sigmoidoscope taken substantially along line 10-10 of FIGURE 5;

FIGURE 11 is a vertical transverse section through the

sigmoidoscope taken substantially along line 11-11 of FIGURE 5; and

FIGURE 12 is an enlarged vertical transverse section through the sigmoidoscope taken substantially along line 12-12 of FIGURE 3.

Having reference now to the drawings, wherein like reference numbers designate the same part in each of the views, the sigmoidoscope comprises an elongated tubular speculum 20 having at its proximal end a flanged reinforcing collar 21 and a surrounding cup guard or stop plate 22. The guard is formed with an indented edge, FIGURES 9-11, to provide feet 24 so that the instrument will not roll when placed upon a table or other support. The speculum 20 may also be provided at its proximal end with a conventional window closure comprising a plane or magnifying lens 25 carried by a swingably mounted rim 27, the latter being pivotally secured to the collar flange 28 as by a hinge pin 30 and having a spring clip 31 to retain it in closed position.

The distal end of the speculum 20 is turned inwardly or bevelled as at 32 to facilitate its entrance into the body passage or duct, the bevelled edge merging with the tip 34 of a substantially conventional obturator 35 which is positioned in the instrument while the latter is being inserted in the passage and is thereafter removed to permit the physician to look through the speculum. On its outer surface, the speculum is provided with centimeter calibrations or graduations 37 for determining the degree of entrance of the instrument into the affected part. A small, open ended tube 38, FIGURES 3 and 4, is fixed to the interior wall of the speculum and extends longitudinally thereof from a point adjacent its distal end to a point adjacent the proximal end where it passes through the wall and terminates in a hose connection 40 see FIGURES 5 and 6. The connection 40 is adapted to be connected by means of a flexible conduit to either a vacuum pump or an air compressor, the former being employed for the withdrawal of smoke when cauterizing and the latter being used when it is necessary to further distend or dilate the passage in which the instrument is positioned.

In accordance with the invention, the sigmoidoscope is provided with an improved lighting arrangement for illuminating the area being examined and to this end, the bottom of the speculum 20 is pushed out or dished out adjacent the distal end thereof to form an interior lamp bulb receiving pocket 41 which is out of alignment with the viewing passage through the speculum, FIGURES 3 and 4. The interior pocket 41 results in a protuberance or projection on the exterior of the speculum which is considerably narrower than the speculum itself, see FIGURE 5, the wall of the protuberance tapering gradually outwardly from the speculum body on its distal side and curving back into the body on its proximal side so that it has a streamlined outline. Communicating with the pocket 41 is a tubular channel 42 which also projects from the bottom of the speculum and extends longitudinally thereof to the proximal end of the instrument, the channel being connected in off-center relation to the pocket as is best shown in FIGURE 5. The open side of the channel communicates with a longitudinal slot 44 in the bottom of the speculum which is co-extensive with the channel and of a width that is slightly less than the channel diameter, see FIGURES 10-12.

The light assembly for the instrument is adapted to be removably assembled therein and comprises an elongated cylindrical light carrier 45 and a lamp bulb 47 secured in side by side, angularly offset relation to one end of the carrier, FIGURES 7 and 8. At its opposite end, the light carrier is provided with an electrical source of for connecting the light assembly to a suitable source of current and, as in conventional light carrier arrange-

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ments, an insulated wire (not shown) within the carrier serves as one conductor for the circuit while the carrier rod itself serves as the other conductor. In accordance with the invention, however, the lamp bulb 47 is larger in diameter than the carrier rod and is larger and brighter than the bulbs that have heretofore been used in this type of instrument.

The light assembly is mounted in the speculum, FIGURE 3, by inserting the bulb end of the light carrier 45 in the proximal end of channel 42 with the bulb extending into the interior of the speculum and sliding the assembly lengthwise into the instrument. The carrier has a close sliding fit with the channel and, as noted hereinabove, the channel open side and communicating slot 44 are narrower than the channel diameter so that the carrier cannot move radially out of the channel into the speculum interior, see FIGURE 12. However, the end of the carrier which connects the bulb is necked down slightly as at 50, FIGURE 7, so that this portion of the assembly will pass through the slot 44 and allow the larger bulb to be positioned in the speculum interior during engagement of the parts as shown in FIGURES 3 and 12.

When the light assembly has been pushed into the instrument far enough to position the connector 43 adjacent the proximal end face of the speculum, the bulb 47 will be located above the pocket 41 and counter clockwise rotation of the connector through approximately 90° will swing the bulb down into the pocket due to the offset relation of the bulb and carrier 45 and off-center relation of the channel 42 and pocket. The bulb and connector will then be in the phantom line positions shown in FIGURE 4 and the connector will be aligned with a radial channel 51 formed in the collar flange 28, the channel being adapted to receive the connector upon further movement of the light assembly into the speculum. Pushing the connector into channel 51 moves the light assembly into its fully engaged position as shown in solid lines in FIGURE 4 and also locks the assembly against further rotation, the pocket 41 being sufficiently long to accommodate the additional lengthwise movement of the bulb therein.

As may be best seen from FIGURE 4, the greatest portion of the lamp bulb is positioned in the pocket and only a relatively small portion thereof projects into the viewing passage through the speculum. The pocket, therefore, enables the use of a larger bulb having a higher light output than has heretofore been possible. In order to reduce the amount of reflected light to a minimum, the interior of the speculum is threaded, or serrated rearwardly of the bulb as indicated at 52 in FIGURE 4. Since the light carrier is normally already assembled in the instrument when the obturator is inserted, the tip 34 of the latter is formed with a groove 54 on its underside, FIGURE 2, to provide clearance for the portion of the lamp bulb that projects into the viewing passage.

It will be understood that the light assembly can be removed from the speculum by simply reversing the process described above for inserting it. However, because of its stronger, more durable construction, the assembly can be left in the instrument when the latter is autoclaved and normally is removed only when it becomes necessary to change the bulb.

From the foregoing description it will be apparent that the invention disclosed herein provides a novel and very practical construction for a sigmoidoscope or the like, which construction affords improved illumination as well as a novel means for assembling and disassembling the illuminating structure in the instrument. As will be apparent to those familiar with the art, the invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The embodiment disclosed is therefore to be considered in all respects as illustrative rather than restrictive, the scope of the invention being indicated by the appended claims.

What is claimed is:

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1. In a medical instrument of the character described, an elongated tubular speculum, a light assembly removably inserted in said speculum to illuminate the distal end thereof, said light assembly including an elongated cylindrical light carrier and a lamp bulb secured in offset relation to one end of said carrier, said bulb having a larger diameter than that of said cylindrical carrier, said speculum being formed with an interior pocket adjacent the distal end thereof, a channel communicating throughout its entire length with the interior of said speculum and extending longitudinally between said pocket and the proximal end of the speculum, said pocket having a substantially greater cross sectional area than that of said channel, said pocket and channel receiving said lamp bulb and light carrier respectively with the bulb being disposed in the pocket with its longitudinal axis in angularly offset relation to the longitudinal axis of said speculum, and means to releasably secure said bulb and carrier in said pocket and channel.

2. In a medical instrument of the character described, an elongated tubular speculum, said speculum having a protuberance on one side thereof adjacent its distal end forming an interior pocket in the speculum, a tubular channel having its open side in communication with the interior of said speculum and extending longitudinally thereof from said pocket to the proximal end of the speculum, said pocket having a substantially greater cross sectional area than that of said channel, a light assembly removably mounted in said speculum to provide illumination at the distal end thereof, said light assembly including an elongated cylindrical light carrier and a lamp bulb, means to connect said bulb to one end of said carrier in offset relation thereto, said bulb having a larger overall diameter than said elongated carrier, said pocket and channel receiving said lamp bulb and light carrier respectively, said carrier having a close sliding fit with said tubular channel, said channel having its open portion in communication with the interior of said speculum, the width of said channel open portion being less than the diameter of said channel whereby said light carrier is prevented from moving radially out of the channel into the interior of said speculum, said light assembly being mounted in said speculum by inserting said light carrier in the proximal end of said channel with said lamp bulb extending into the interior of the speculum and sliding the assembly lengthwise in the speculum until the bulb is opposite said pocket, said carrier and bulb connecting means extending through said channel open portion during said sliding movement, said light carrier then being rotated to move said bulb into the pocket, said bulb being positioned in said pocket with its longitudinal axis in angularly offset relation to the longitudinal axis of said speculum.

3. In a medical instrument of the character described, an elongated tubular speculum, a light assembly removably mounted in said speculum to provide illumination at the distal end thereof, said light assembly including an elongated cylindrical light carrier and a lamp bulb secured to one end of said carrier in angularly offset side by side relation thereto, said bulb having a larger overall diameter than said elongated carrier, said speculum being formed with an interior pocket adjacent its distal end to form an interior pocket therein and having a tubular channel communicating with said pocket and extending rearwardly to the proximal end of the speculum, said pocket having a substantially greater cross sectional area than that of said channel, said pocket and channel receiving said lamp bulb and light carrier respectively, said carrier having a close sliding fit with said tubular channel, said channel having its open portion in communication with the interior of said speculum, the width of said channel open portion being less than the diameter of said channel whereby said light carrier is prevented from moving radially out of the channel into the interior of said speculum, said light assembly being mounted in said speculum by in-

serting said light carrier in the proximal end of said channel with said lamp bulb extending into the interior of the speculum and sliding the assembly lengthwise into the speculum until the bulb is opposite said pocket, said light carrier then being rotated to move said bulb into the pocket, means at the proximal end of said light carrier for making an electrical connection thereto, and means at the proximal end of said speculum adapted to receive said connecting means after said light carrier has been rotated to position said bulb in said pocket, said light assembly being moved lengthwise further into the speculum after said rotation to engage said connecting and receiving means whereby further rotation of said assembly is prevented, said pocket being longer than said bulb to permit said further lengthwise movement of the light assembly.

4. In a medical instrument of the character described, an elongated tubular speculum, said speculum having a protuberance on one side thereof adjacent its distal end forming an interior pocket in the speculum, the wall of said protuberance tapering gradually outwardly from said speculum body on its distal side and being curved inwardly on its proximal side whereby the outline thereof is streamlined with respect to the speculum body, a tubular channel having its open side in communication with the interior of said speculum and extending longitudinally thereof from said pocket to the proximal end of the speculum, said pocket having a substantially greater cross sectional area than that of said channel, said channel being connected in off-center relation to said pocket, a light assembly removably mounted in said speculum to provide illumination at the distal end thereof, said light assembly including an elongated cylindrical light carrier and a lamp bulb secured to one end of said carrier in an angularly offset side by said relation thereto, said bulb having a larger overall diameter than said elongated carrier, said pocket and channel receiving said lamp bulb and light carrier respectively, said carrier having a close sliding fit with said tubular channel, said channel having its open portion in communication with the interior of said speculum, the width of said channel open portion being less than the diameter of said channel whereby said light carrier is prevented from moving radially out of the channel into the interior of said speculum, said light assembly being mounted in said speculum by inserting said light carrier in the proximal end of said channel with said lamp bulb extending into the interior of the speculum and sliding the assembly lengthwise in the speculum until the bulb is opposite said pocket, said light carrier then being rotated to move said bulb into the pocket, said bulb being positioned in said pocket with its longitudinal axis in

angularly offset relation to the longitudinal axis of said speculum.

5. In a medical instrument of the character described, an elongated tubular speculum, a light assembly removably mounted in said speculum to provide illumination at the distal end thereof, said light assembly including an elongated cylindrical light carrier and a lamp bulb, means connecting said bulb to one end of said carrier in offset relation thereto, said bulb having a larger overall diameter than said elongated carrier, said speculum having an interior pocket adjacent the distal end thereof and a tubular channel communicating with said pocket and extending rearwardly to the proximal end of the speculum, said pocket having a substantially greater cross sectional area than that of said channel, said pocket and channel receiving said lamp bulb and light carrier respectively, said carrier having a close sliding fit with said tubular channel, said channel having its open portion in communication with the interior of said speculum, the width of said channel open portion being less than the diameter of said channel whereby said light carrier is prevented from moving radially out of the channel into the interior of said speculum, said light assembly being mounted in said speculum by inserting said light carrier in the proximal end of said channel with said lamp bulb extending into the interior of the speculum and sliding the assembly lengthwise into the speculum until the bulb is opposite said pocket, said carrier and bulb connecting means extending through said channel open portion during said sliding movement, said light carrier then being rotated to move said bulb into the pocket, means at the proximal end of said light carrier for making an electrical connection thereto, and means at the proximal end of said speculum adapted to receive said connecting means after said light carrier has been rotated to position said bulb in said pocket.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,032,031

May 1, 1962

William Clay Moore

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 70, for "source of" read -- connector
48 --.

Signed and sealed this 28th day of August 1962.

(SEAL)

Attest:

ESTON G. JOHNSON

Attesting Officer

DAVID L. LADD

Commissioner of Patents