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Patented Apr. 16, 1901.

W. E. DOW.
SPECULUM.

(Application filed Aug. 16, 1899.)

(No Model.)

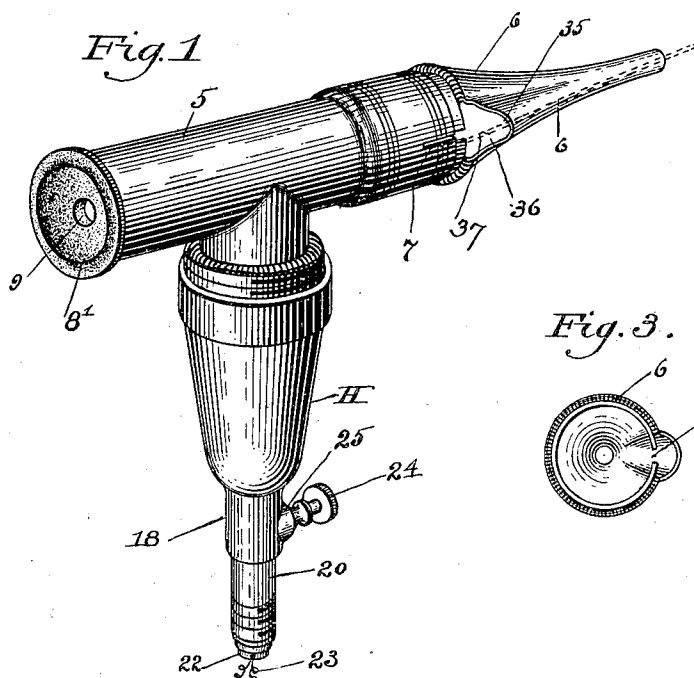


Fig. 3.

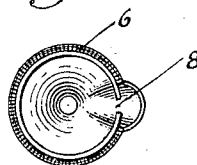
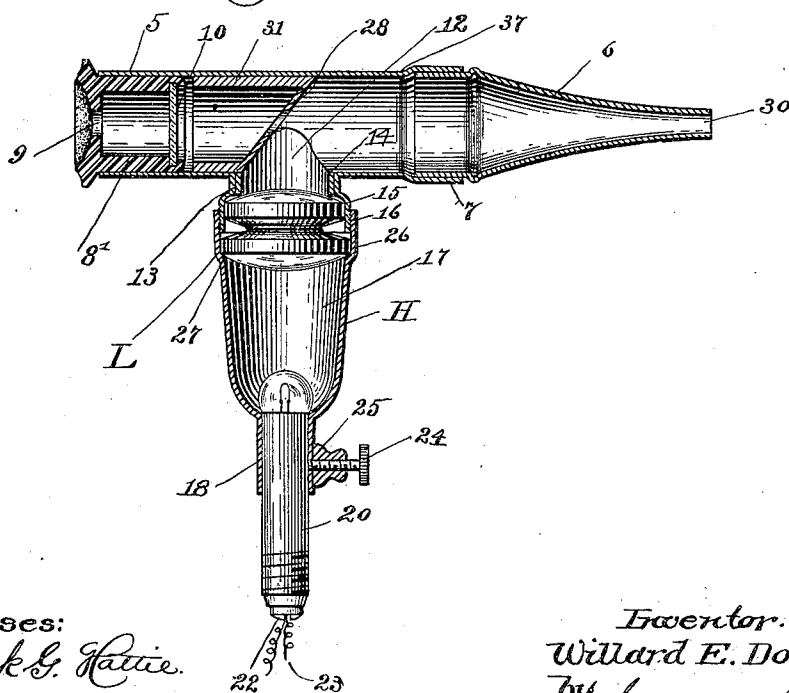


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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SPECULUM.

SPECIFICATION forming part of Letters Patent No. 672,317, dated April 16, 1901.

Application filed August 16, 1899. Serial No. 727,376. (No model.)

To all whom it may concern:

Be it known that I, WILLARD E. DOW, a citizen of the United States, residing at Braintree, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Surgical Appliances, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings representing like parts.

This invention relates to a surgical appliance; and it is the object of the invention to provide an improved device of this character which is especially adapted for exploring cavities which are generally inaccessible and for directing an operating instrument to the part under observation without removing the device from the eye.

My improved surgical appliance includes as one of its features what I will term a "scope," provided with a guide portion constructed and located to direct an operating instrument or similar device to the organ under observation by the surgeon, and, as in the present case, the appliance is provided with means for throwing a ray or pencil of light of high intensity to the organ. The advantage of this construction will be apparent at once, for the user can see with great distinctness the part upon which he is to operate, and at the same time the instrument employed by him will be guided with extreme accuracy to such part, and both these can be accomplished without the necessity of taking the scope from the eye. The scope is bored longitudinally thereof, and in the present instance it is furnished with a removable tip, which can be quickly detached and one of a different kind substituted, if deemed expedient, and while this tip may be of any shape I prefer to make it of tapering form and a form having in the side thereof an instrument-receiving opening, through which an operating instrument can be passed and projected through the tip and into or upon an organ or foreign growth thereon. I prefer to mount upon the device a light of suitable kind and means for multiplying or intensifying the strength of the light, and the rays are projected through the tapered or reduced end of the scope, and are thereby concentrated upon an object. It will be evident, therefore, from the preceding statement

that my improved surgical appliance includes a scope constructed to receive from its exterior an instrument and to guide the same into the path of a ray of light projected through the scope while the eye of the user is applied to said scope.

In the drawings, Figure 1 is a perspective view of a surgical appliance constructed in accordance with my invention in a simple embodiment thereof. Fig. 2 is a vertical central section side elevation of the same, and Fig. 3 is a detached view of the tip.

My improved surgical appliance in the embodiment thereof represented in the accompanying drawings includes in its construction a scope, as S, which may be used for examination of the ear, nose, throat, &c., and this scope may be of any suitable shape or material. The scope illustrated consists of a longitudinal main cylindrical portion 5 and a tip 6, the latter being detachably connected to the main portion 5, and the tip is of tapered or funnel form. The cylindrical portion 5 near the front end thereof has a kerf or slot 7, while the inner end of the tip has a substantially similar slot 8, this being for the purpose of securing resiliency, so that the cylindrical end of the cap 6 can be freely inserted in and removed from the main section 5. The rear end of the cylinder 5 receives the eyepiece 8', usually made of vulcanized rubber, having an eye-opening 9 and provided with a lens 10 of proper kind. The cylindrical or tubular portion 5 has upon its underside the opening 12, which is surrounded by an annular offset or projection 13, to which the handle H is detachably fitted, said handle being transversely disposed relatively to the tubular portion 5 of the scope. This offset receives internally the reinforcing-ring 14, which is secured thereto in some convenient manner. The annular offset 13 is externally threaded, as at 15, to be engaged by the internal threads at the upper end of the tubular or hollow handle, the latter being substantially funnel-shaped and the main or larger portion being somewhat rounded where it merges into the reduced portion. The handle H is in the nature of a reflector, its inner face 17 being of parabolic shape to receive the rays from a lamp or light, which are transmitted to a lens, as L, hereinafter more par-

particularly described, downward through the hollow shank or stem 18. Handle H, which is of reduced diameter, is adapted to receive the carrier 20 of the incandescent lamp 21, the carrier 20 being slidable longitudinally in the stem to regulate the focus. The wires 22 and 23 are connected with the lamp 21 and also with a battery or other electrical generator. (Not shown.) The carrier 20, and consequently the lamp 21, is adjustable, the lamp being movable with respect to the parabolic reflecting-surface 17, whereby the focus can be regulated with perfect nicety, and the lamp is maintained in an adjustable condition in some suitable manner, as by means of a set-screw 24, threaded through the boss or projection 25 upon the hollow stem 18, the inner end of the said screw being adapted to bind against the carrier 20, thereby to hold the same, and consequently the lamp, in an adjusted position.

It is not deemed essential to represent herein the particular construction of the carrier 20 nor the connection between the wires 22 and 23 and the lamp 21, for these may be of the kinds common in this class of devices.

I dispose in advance of the reflector 17, which it will be remembered constituted a part of the handle H, a lens, as L, which may be of any suitable character; but that represented is of a condensing kind, it being a double convexo-convex one and being inclosed by a duplex carrying-ring 26, the respective members of which are fitted within the tubular offset 13 and upper enlarged end of the handle H, and the lower section of this duplex ring rests upon the annular shoulder or bead 27 upon the inside of said handle. From this it will be evident that the light from the lamp 21 is intensified materially, which is of great importance in making surgical examinations.

In connection with the primary reflector 17 and condensing or multiplying lens L, I provide a secondary reflector, as 28, it being shown as consisting of a plate of substantially oval form and having a central opening 29 in line with the eye-opening 9 and an opening 30 at the end of the tip 6. What is shown as the right-hand face of the plate 28 constitutes the reflecting portion thereof, and the opposite side thereof is furnished with an annular flange 31, which snugly fits within the cylindrical portion 5 of the scope, and said secondary reflector, by reason of its construction, can be slid back and forth, if necessary. The reflector 28 is set at an angle to the condensing-lens L, and the light-rays 21 from the reflecting-surface 17 are projected through the said condensing-lens onto the annular reflecting-surface of the reflector 28 and from thence projected forward through the reduced opening 30 in the tip 6. The surgeon can grasp the handle H and hold the eye-piece to his eye and can look through the aligned openings 29 and 30 into the cavity, and the light from the lamp will be successively

multiplied by the two reflectors and the compound lens, so that he can see with great brightness the part he is exploring.

Certain of the parts previously described can be dispensed with or their relative position changed or different kinds employed without departing from the spirit of the invention, and it will be understood that the part H serves as a handle and its interior as a reflecting-surface, although it is not essential that such part be utilized as a handle, but is simply advantageous. It will also be understood that the tip 6 is removable and that a different one can be substituted, different kinds and shapes of tips being employed for different kinds of operations or examinations.

In making surgical examinations it is now the custom to employ a lamp to throw a light upon the part to be treated, and the hand of the operator while working ordinarily throws shadows upon the part under treatment or observation, and, as will be apparent, this is decidedly detrimental. To overcome this, I provide my surgical appliance with an instrument-guiding portion which serves to direct the instrument to the place under observation, and this without removing the appliance from the eye, so that it is possible to throw a strong, unobstructed, and concentrated light upon the part while the surgeon is operating upon the same. The instrument-guiding portion may be of any suitable kind. In the drawings I have illustrated an opening in the side of the scope through which an instrument of the proper kind can be inserted and projected forward through the reduced or tapered end of the tip 6 and directly upon the part upon which the light is thrown. The tip 6 is represented as having the semicircular channel or offset 35 formed from the stock thereof and tapering into the same, as clearly represented in Figs. 1 and 2, and in this offset the opening 36 may be formed, and an instrument, as 37, can be passed through this side opening, which, it will be observed, is located near the forward end of the device and will be guided by the wall of the tapered tip 6 exactly to the point. Therefore it will be understood that I claim a surgical appliance having an instrument-guiding portion adapted to receive an instrument and to direct the same to the part under observation without the necessity of removing the appliance from the eye, the advantages of which have previously been set forth, and this feature, as well as certain others, may be modified to any extent within the scope of the accompanying claims.

By the expression "outer end" as employed in the claims I refer to that part of the tubular scope to which the eye is applied in making examinations.

It is obvious, of course, that the invention may be modified within the scope of the accompanying claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a surgical appliance, a scope consisting of a tube, a light-receiving opening in the side of said tube, means to direct a ray of light through said opening and project the same through the inner end of the tube, and an instrument-guiding channel in the side of said tube, and between the light-receiving opening and the inner end of the tube.

2. In a surgical appliance, a scope consisting of a tube, the tube having a light-receiving opening and an instrument-guiding channel in its side, a hollow projection surrounding the light-receiving opening, an angularly-disposed reflector situated in the tube having an opening, and a light located in said hollow projection.

3. A surgical appliance including a scope provided interiorly with a reflector and having an opening, said scope having an instrument-receiving opening in its side in advance of the reflector and an eyepiece having an opening and provided with a lens, the lens being located back of said reflector.

4. In a surgical appliance, a scope consisting of a tube, the tube having a light-receiving opening and an instrument-receiving opening in its side, said instrument-receiving opening being located between the light-receiving opening and the inner end of the tube, a hollow projection surrounding the light-receiving opening, the inner surface of which constitutes a reflector and a second reflector in the scope to receive rays of light from the first-mentioned reflector, and to transmit the same through the forward or inner end of the tube.

5. A surgical appliance comprising a scope, a hollow device extending transversely there-

from and provided internally with a reflector, a lens located in advance of the reflector, and a second reflector disposed within the scope and located in advance of the lens.

6. A surgical appliance comprising a scope, a hollow device extending transversely therefrom and provided internally with a reflector, a lens located in advance of the reflector and a second lens disposed within the scope, and a lamp adjustably supported by said hollow device and disposed to project its rays toward the first-mentioned reflector.

7. A surgical instrument comprising a scope having a side opening to receive an operating surgical instrument without removing the scope from the eye, and an angularly-disposed reflector in said scope and having an opening, an eyepiece provided with a lens and having an eye-opening in line with said first-mentioned opening, a handle extending transversely from the scope and provided respectively with a condensing-lens, a reflector and a light.

8. In a surgical appliance, a scope consisting of a tube having an eyepiece at its outer end, a light-receiving opening in the side of the tube between the eyepiece and the inner end, means to direct a ray of light through said opening and project the same through the inner end of the tube, and an instrument-guiding channel in the side of said tube and between the light-receiving opening and the inner end of the tube.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLARD E. DOW.

Witnesses:

HEATH SUTHERLAND,
GEO. W. GREGORY.