

No. 799,114.

PATENTED SEPT. 12, 1905.

C. D. TRACEY.

SPECULUM.

APPLICATION FILED APR. 27, 1905.

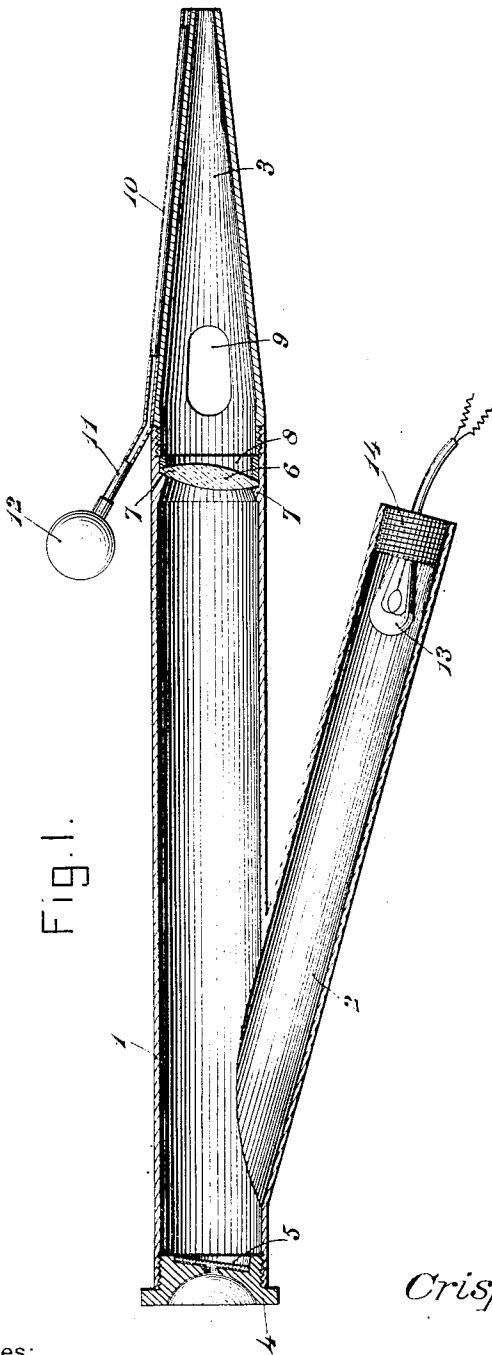


Fig. 1.

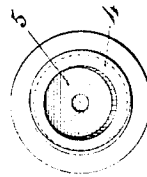


Fig. 2.

Witnesses:

E. H. Bennett
R. M. Elliott

Crispus D. Tracey

Inventor,

by

C. A. Snow & Co.

Attorneys.

UNITED STATES PATENT OFFICE.

CRISPUS D. TRACEY, OF LITTLE ROCK, ARKANSAS, ASSIGNOR OF TWO-THIRDS TO MARGARET BARNHART, OF DUNKIRK, INDIANA.

SPECULUM.

No. 799,114

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed April 27, 1905. Serial No. 257,709.

To all whom it may concern:

Be it known that I, CRISPUS D. TRACEY, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented a new and useful Speculum, of which the following is a specification.

This invention relates to speculums.

The object of the invention is to provide a novel form of implement of this character in the use of which the ready exploring of cavities that are generally inaccessible shall be facilitated, in which an operating instrument may be readily directed to the spot desired, and, further, in which a curative agent may be applied or pus or the like be removed and all without removing the implement from the eye.

A further object is to dispose the lens in such manner as to cause the axial ray to suffer refraction only in a small degree, thereby preventing the secondary axial rays from having sufficient power over the slightly-refracted axial ray to hold the image of light to the surface of the lens, thus giving a clear and distinct view therethrough.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a speculum, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, Figure 1 is a view in vertical longitudinal section through a speculum constructed in accordance with the present invention. Fig. 2 is an end view looking toward the eyepiece of speculum.

The implement embodies in its construction a main tube 1, a light-tube 2, disposed at an angle thereto and permanently connected therewith, and a tapered nozzle 3, detachably connected with the main tube. Combined with the end of the tube opposite the nozzle, and which will hereinafter be designated the "outer" end of the tube, is an eyepiece 4, which is held assembled with the main tube in this instance by a threaded joint, the eyepiece being of the usual or any preferred construction and having combined with its inner face a diaphragm-mirror 5, which, as shown, is disposed at an angle of about ten degrees or slightly more or less to the long diameter of

the tube. At or adjacent to the point of junction of the nozzle with the main tube, and which will hereinafter be termed the "inner" end of the tube, is arranged a double-convex lens 6, which is also disposed at an angle of about ten degrees, more or less, to the long diameter of the tube, the lens being held in position on one side by an inclined circumferential shoulder 7, secured to or formed integral with the main tube, and on its other side by an ungula-form thimble or collar 8.

The nozzle 3, which may be tapered to any degree desired, is provided in one side with an aperture 9, through which an instrument may be inserted and guided by the converging walls of the nozzle to the point to be operated upon or to be treated. The outer side of the nozzle has secured to or formed integral with it a tube 10, which terminates with the end of the nozzle, and has an angularly-deflected portion 11, with which is combined a compressible bulb 12, which may be employed for withdrawing foreign matter from a wound or the like by a suction or be employed to inject a curative or sanatory agent to the desired point.

The free end of the light-tube carries an incandescent lamp 13, the socket 14 of which engages threads provided on the interior of the tube for the purpose, the conductors being connected with any suitable source of electric energy. (Not necessary to be shown.)

In the use of the device the nozzle is inserted in the cavity or orifice to be explored and by reason of the light-rays reflected from the diaphragm-mirror through the lens minute inspection of the diseased or other part may be readily secured. Should the part inspected require surgical or other treatment necessitating the employment of an instrument, this will be inserted through the orifice 9. Should it be necessary to withdraw matter from the cavity, this may be effected by suction exerted by the bulb 12, or if a curative agent is to be injected this may also be secured by the employment of a bulb and tube.

The features of novelty of this invention reside, specifically stated—

First, in the employment of the tapered nozzle combined with the tube and bulb. The nozzle is to be made of such length and taper as to adapt it to fit the natural size and depth of the cavity entered.

The second feature of novelty of the inven-

tion resides in placing a convex condensing-
lens at the larger end of the nozzle and of such
refracting power that its power of conver-
gence is of the strength to converge the light
5 reflected from the mirror at the same angle of
taper as that of the nozzle and of such focusing
power that its focus forms at or immediately
beyond the exit or point on the nozzle. The
volume of light as converged so completely
10 fits the taper of the nozzle that it affords com-
plete protection from any source of light
striking it except that reflected by the mirror
and also prevents the loss or confusion of
lights by reflection from the walls of the
15 nozzle.

The third feature of novelty of the inven-
tion resides in the angular disposition of the
convex lens. It has heretofore been found
that a strong double-convex lens on account
20 of its thick center and thin edges will not per-
fectly refract ordinary light reflected through
it, as an image of the flame and the reflector
will always remain on the surface of the lens,
thereby obstructing the view. This objec-
25 tion has been overcome by placing the lens-
surface off of a perpendicular to the incident
light to an extent sufficiently to cause the
axial ray to suffer refractions only in a small
degree, and this prevents the secondary axial
30 rays from having sufficient power over the
slightly-refracted axial ray to hold the image
of light to the surface of the lens, thereby
giving a clear and distinct view through the
lens.

35 It is of course obvious that a weaker or
stronger lens may be used with a shorter or
longer nozzle without departing from the es-
sential principles of the invention so long as
the relationship, taper of nozzle, and strength
40 of lens are maintained.

Having thus described the invention, what
is claimed is—

1. A speculum embodying in its construc-
tion a main tube and a diaphragm-mirror and
45 double-convex lens arranged therein and dis-
posed at an angle to the long diameter there-
of, and means for supplying light to the mir-
ror.

2. A speculum provided at its outer end
with an eyepiece carrying a diaphragm-mir- 50
ror disposed at an angle to the long diameter
of the tube, a tapered extension arranged at
the inner end of the tube, a double-convex
lens disposed in the main tube and at an angle
to the long diameter thereof, and means for 55
supplying light to the mirror.

3. A speculum comprising a main tube pro-
vided at its outer end with an eyepiece, car-
rying a diaphragm-mirror disposed at an angle
to the long diameter of the tube, a light-tube 60
combined with the main tube and projecting
at an angle therefrom, a tapered extension
secured to the inner end of the main tube, a
double-convex lens arranged near the inner
end of the main tube and disposed at an angle 65
to the long diameter thereof, and means com-
bined with the light-tube for supplying light
to the mirror.

4. A speculum comprising a main tube, a
light-tube secured thereto and projected at 70
an angle therefrom, an electric lamp combined
with the outer end of the light-tube, an eye-
piece combined with the outer end of the
main tube and having a diaphragm-mirror
disposed at an angle to the long diameter of 75
the main tube to catch and reflect the light-
rays from the lamp, a double-convex lens ar-
ranged in the inner end of the main tube and
disposed at an angle to the long diameter
thereof, and a tapered extension projecting 80
from the inner end of the main tube.

5. A speculum comprising a main tube pro-
vided at its outer end with an eyepiece car-
rying a diaphragm-mirror, at its inner end
with a tapered extension, a double-convex 85
lens secured in the main tube adjacent to its
point of juncture with the extension, and
means for supplying light to the mirror.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in 90
the presence of two witnesses.

CRISPUS D. TRACEY.

Witnesses:

WM. A. PFISTERER,
R. G. PILLOW.