

R. H. WAPPLER.

ENDOSCOPE.

APPLICATION FILED MAY 17, 1909.

998,310.

Patented July 18, 1911.

Fig: 1.

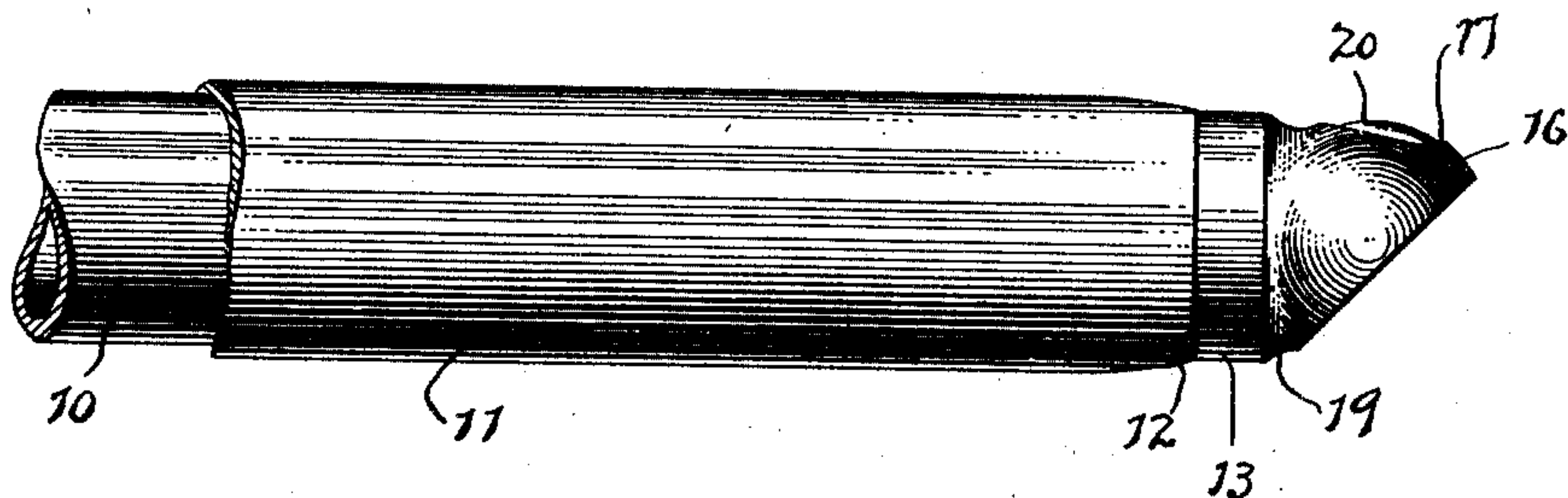
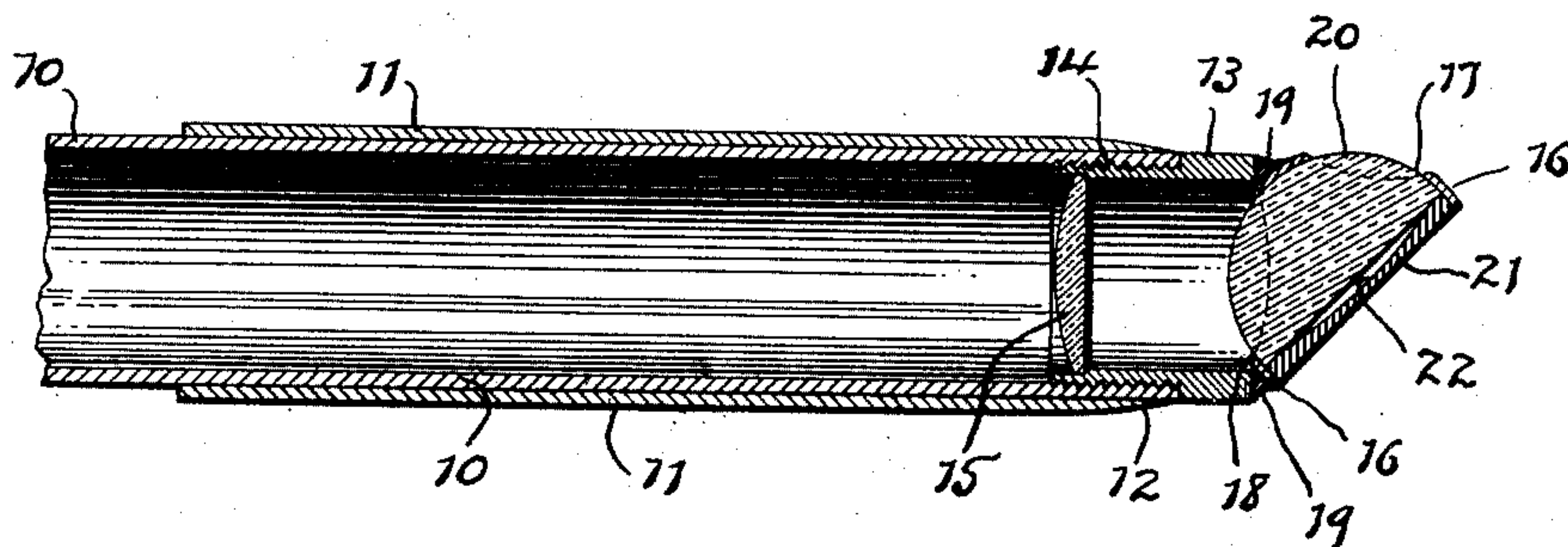


Fig: 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

REINHOLD H. WAPPLER, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN CYSTOSCOPE MAKERS, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ENDOSCOPE.

998,310.

Specification of Letters Patent. Patented July 18, 1911.

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To all whom it may concern:

Be it known that I, REINHOLD H. WAPPLER, a citizen of the United States, residing at the borough of Manhattan, city, county, and State of New York, have invented an Improvement in Endoscopes, of which the following is a specification.

This invention relates to an endoscope or other similar optical instrument, and particularly to the construction of the outer or lens tip end thereof, the particular object of the invention being to improve the manner of constructing these parts and placing the same together so that the frame employed for the reflecting glass or lens, may be set at substantially any desired angle.

In carrying out my present invention, the endoscope preferably comprises a tube, a tip adapted to be secured in the end of the tube, an objective lens set in one end of the tip, a reflecting lens and a member in which said reflecting lens is set at an angle in the other end of the tip and secured therein,—as will be hereinafter more particularly described.

In the drawing, Figure 1 is an elevation of that part of an endoscope to which my invention relates, and Fig. 2 is a central longitudinal section of the same.

Referring particularly to the drawing, the endoscope tube is indicated at 10. Together with the tube as is common in the class to which this invention relates, there is provided a sheath 11 into which the tube 10 fits, and as is also customary, the outer end of the sheath 11 is tapered to a point as indicated at 12.

13 designates the tip which exteriorly at one end is screw threaded and is adapted to be secured to the outer end of the tube 10 by being screwed into the same as indicated at 14. Within the screw threaded end of the tip 13 an objective lens 15 is mounted in any suitable manner. In carrying out my present invention I also employ a hollow semi-spherical member 16 which is provided in suitable positions with apertures indicated at 17, 18, respectively, and this hollow semi-spherical member 16 is adapted to receive a reflecting lens 20 and as will be un-

derstood, to abut against the outer end of the tip 13 and to be secured thereto by means of solder 19 or in any other suitable manner.

21 indicates a backing which is placed within the hollow semi-spherical member 16 and against which the reflecting lens 20 rests, the inner face of this backing 21 being concave as indicated at 22, so that the contact between the silver surface of the lens and the face of the backing is only at the periphery of these parts, and as will be understood, the backing 21 is secured in place within the hollow semi-spherical member 16 by being brazed therein or otherwise.

I claim as my invention:

1. In an endoscope, a hemispherical lens having a substantially flat reflecting back, a hollow substantially hemispherical metal member receiving the said lens and having two oppositely disposed apertures opening up the lens to the light image and its reflection, a backing plate fitting the hollow metal member back of the lens and securely fastened thereto for holding the same in place, a tubular open-ended tip and means for securing the hollow metal member to one end of said tip, with the base of the lens placed at an angle of about 45 degrees to the axis of the endoscope.

2. In an endoscope, a hemispherical lens having a substantially flat reflecting back, a hollow substantially hemispherical metal member receiving the said lens, a backing plate fitting the hollow metal member back of the lens and securely fastened thereto for holding the same in place and the inner surface of said backing plate concaved to touch the lens only around the edge thereof, a tubular open-ended tip and means for securing the hollow metal member to one end of said tip, with the base of the lens placed at an angle of about 45 degrees to the axis of the endoscope.

3. In an endoscope, a hemispherical lens having a substantially flat reflecting back, a hollow substantially hemispherical metal member receiving the said lens and having two oppositely disposed apertures opening up the lens to the light image and its re-

flection, a backing plate fitting the hollow metal member back of the lens and securely fastened thereto for holding the same in place, a tubular open-ended tip and means
5 for securing the hollow metal member to one end of said tip, with the base of the lens placed at an angle of about 45 degrees to the axis of the endoscope and an objective lens

secured in the other end of the open-ended tip.

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Signed by me this 5th day of May, 1909.

REINHOLD H. WAPPLER.

Witnesses:

GEO. T. PINCKNEY,
BERTHA M. ALLEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."