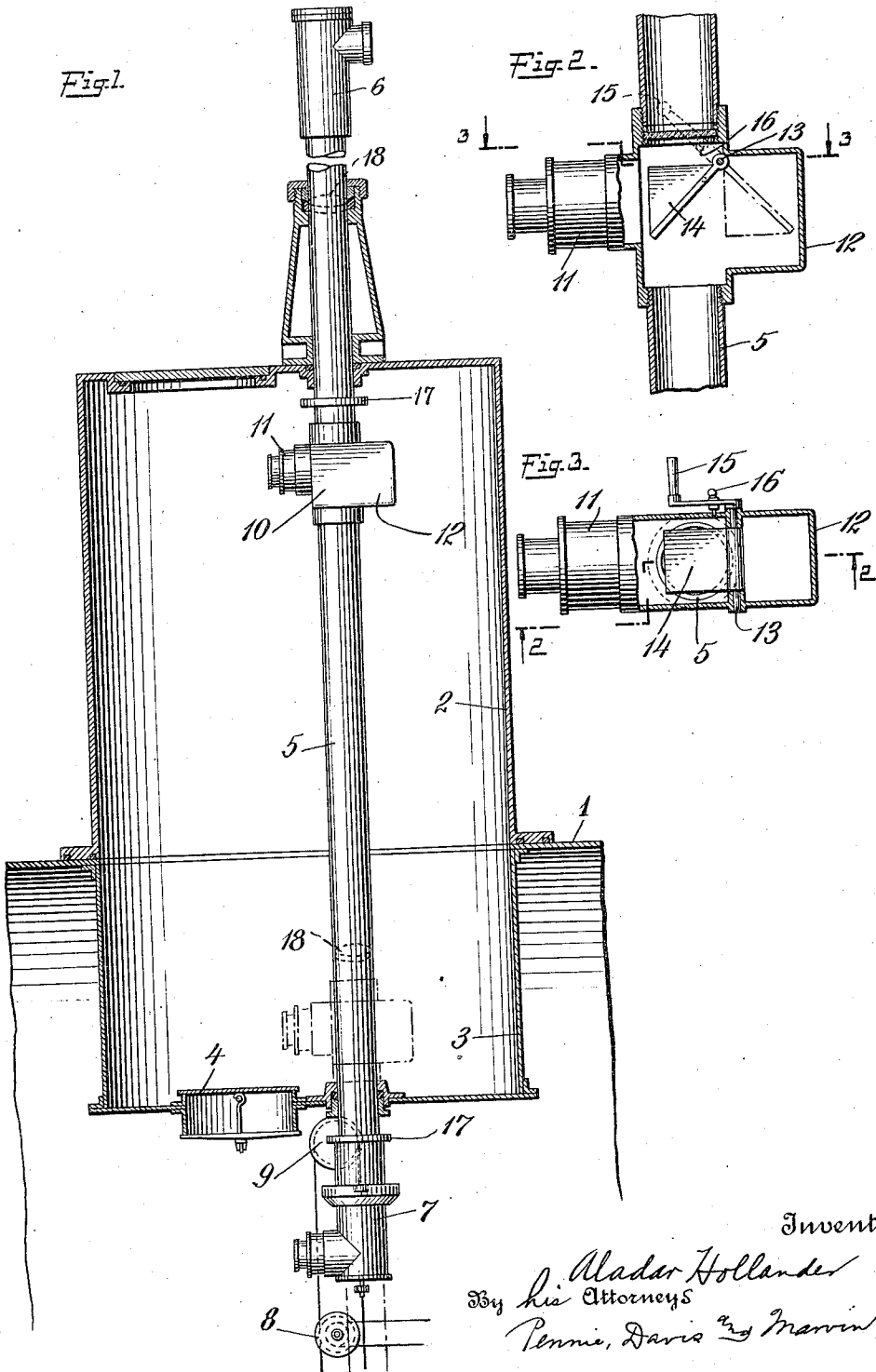


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PERISCOPE.
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1,290,744.



Inventor

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UNITED STATES PATENT OFFICE.

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PERISCOPE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALADAR HOLLANDER, a citizen of Hungary, and a resident of New London, county of New London, and State of Connecticut, have invented certain new and useful Improvements in Periscopes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in periscopes, and particularly to periscopes for submarine vessels.

Submarine vessels as now constructed are provided with a conning tower projecting to a height of several feet above the upper wall of the hull or deck of the vessel, in which tower the commanding officer usually takes his position when the vessel is cruising on the surface. The vessels are also provided with periscopes projecting to a height above the conning tower and carrying objectives for receiving images which are observed through the eyepiece at the lower end of the periscope within the hull of the boat, the periscope being used for observation when the vessel is submerged.

It is frequently necessary for the officer in the conning tower to make observations not possible through the observation windows or open top of the tower, for instance while the vessel is being submerged. To this end it has been proposed to provide the conning tower with an auxiliary periscope, but such design has not met with favor chiefly for the reason that it occupied that much additional space in the already over-crowded interior of the vessel and added to the resistance of the vessel when running submerged.

By my present invention I provide a construction by means of which a single periscope, occupying no greater space than the present periscopes, is adapted to perform all the functions of such periscopes and may also be used with equal facility by the officer in the conning tower.

With the above object in view, my invention consists in the construction illustrated in the accompanying drawings and hereinafter described, it being of course understood that the invention is not limited to

the details of construction disclosed except in so far as recited in the appended claims. 55

In said drawings:

Figure 1 is a longitudinal sectional view through the conning tower and a portion of the hull of a submarine vessel equipped with my improved periscope, the periscope being shown in side elevation; 60

Fig. 2 is a detail view on an enlarged scale showing a portion of the periscope tube in vertical section on line 2—2 of Fig. 3; and 65

Fig. 3 is a detailed view of the parts shown in Fig. 2 partly in section on line 3—3 of Fig. 2.

Referring to the drawings, particularly to Fig. 1, 1 indicates the upper wall of the hull of the vessel on which is supported the shell 2 of the outboard portion of the conning tower. Coincident with the wall of the shell 2 is an inwardly projecting shell 3 forming with the shell 2 the conning tower inclosure. The interior of the conning tower communicates with the rest of the vessel through a trap 4 having a water-tight closure and is provided at its upper wall with a hatch-way having a water-tight cover through which the lookout projects his head for taking observations, or if desired, the conning tower may be provided with suitable glass closed observation windows, not shown. 85

The periscope 5 consists of a continuous closed tube projecting vertically entirely through the conning tower with suitable stuffing boxes in the roof and floor thereof, the tube having attached at its upper end the casing 6 for the objective lenses and reflecting prism which may be of any preferred construction. 90

The lower end of the periscope is provided with the usual eye-piece 7 containing the lenses and prism which may be of any preferred design, and form no part of the present invention. The periscope is mounted for vertical movement in its packed bearings and is provided with a windlass 8 and cable for raising and lowering the periscope at will. It will be understood that the cable is a continuous one passing over upper and lower pulleys, the upper of which is shown at 9, one reach of the cable being connected to the periscope and the other being coiled 105

around the windlass, whereby rotation of the windlass in either direction will effect a corresponding movement of the periscope. The windlass may be rotated by hand or
5 may be power driven, as for instance from a driving belt as indicated, or by a directly connected air or electric motor.

In order to permit the periscope to be used by the officer in the conning tower the tube 5
10 is formed in two sections connected by a supplemental eye-piece casing 10 within the conning tower. The casing 10 is located at such point on the tube 5 as to be elevated to a position near the roof of the conning
15 tower when the periscope is raised to its extreme upper position as shown in full lines in Fig. 1. The eye-piece casing 10 is provided in one side with the usual lateral pro-
20 jection 11 for supporting the lenses and on the opposite side with a light-tight enlargement 12, and rotatably supported in the casing adjacent the tube 5 is a shaft 13 on which is supported within the casing a re-
25 flecting prism 14 adapted when the shaft is adjusted to its extreme position in one di-
rection to maintain the prism in its reflect-
ing position to receive the rays from the
objective and direct them into the lens-
holder 11.

30 The shaft 13 is mounted to have an ampli-
tude of movement of 90 degrees whereby the prism 14 will be adjusted into the en-
largement 12 of the casing as indicated in
dotted lines in Fig. 2 to leave the periscope
35 tube unobstructed so that observations may be made in the usual manner through the
lower eye-piece 7. The shaft 13 projects be-
yond the wall of the casing in one end and
40 is provided with an actuating crank 15 and
with a latch 16 for locking the prism in
either of its extreme positions of adjust-
ment.

The periscope tube is mounted for rota-
tion in its stuffing boxes in the usual manner
45 and hand wheels 17 or other mechanism may be provided for rotating the periscope; such
mechanism should, however, be so designed
as to permit of the periscope tube being ro-
tated from a position within the conning
50 tower.

It will of course be understood that the
periscope tube is provided at intervals with
the usual condensing lenses as indicated at
18 in dotted lines, for converging and cross-
55 ing the light rays in transmitting the image
from the objective to the eye-piece, and it
will be understood that the upper eye-piece
11 is so located with relation to the position
of one of the intermediate condensers for
60 its lenses to properly co-act with the con-
denser producing the image.

The operation of the device will now be
described. When the vessel is running sub-
merged the observations are preferably
65 made by an officer in the main body of the

vessel by means of the periscope which is
raised at intervals above the surface of the
water to make the observations, and then
immediately lowered to guard against de-
tection by a hostile craft. When, however, 70
the vessel is running with the decks awash
and particularly when the boat is being sub-
merged, the officer in command takes his
position in the conning tower in order to
correctly direct the operation of the ballast 75
tank valves until the vessel is submerged al-
most to the conning tower hatch. During
such period it is frequently desirable to use
the periscope to make distant observations
from the higher altitude of the objective 80
and also to maintain a continuous lookout
while the boat is going down after the outer
hatchway must be closed. By means of the
present invention, the officer in the conning
tower may, by turning the prism 14 to its 85
full line position, use the periscope as de-
scribed. As soon as the observation is made
the prism may be returned to the dotted line
position to permit the periscope to be used
if desired by the officer in the main compart- 90
ment of the boat.

I claim:

1. In a submarine boat having a conning
tower the combination of a periscope tube
projecting above the conning tower and pro- 95
vided with an outboard objective and a
plurality of eye-pieces mounted one within
and one without said conning tower, said
periscope comprising optical means ar-
ranged for observation through said objec- 100
tive to be made from either eye-piece.

2. In a periscope the combination of a
periscope tube having an objective at its
upper end, a plurality of eye-pieces arranged
one above the other for coöperation with 105
said single objective, the optical elements
of said periscope comprising a reflector
movably mounted opposite the eye-piece
nearest the objective and adapted to be ad-
justed either to a position to reflect the rays 110
from the objective into said upper eye-piece,
or to a position out of the path of such
rays.

3. In a periscope the combination of a
periscope tube, an objective at the end there- 115
of, an eye-piece at the other end thereof and
a second eye-piece intermediate the ends of
the tube, said periscope comprising optical
means whereby images received by said ob- 120
jective may be viewed through either eye-
piece, said elements comprising a reflector
mounted adjacent the position of said inter-
mediate eye-piece, and adjustable to a posi-
tion to deflect all the rays from said objec-
tive into said intermediate eyepiece or to a 125
position beyond the circumference of said
tube to provide an unobstructed passage
from the objective to the second eyepiece.

4. In a submarine boat having a conning
tower with an elevated floor, a periscope 130

comprising a tube extending vertically through said conning tower provided with an outboard objective, an eye-piece connected to said tube within the hull of the boat and beneath the floor of the conning tower and a second eye-piece carried by said tube within the conning tower inclosure, said periscope embodying optical means whereby images received by said objective may be viewed through either eye-piece.

5. In a periscope the combination of a periscope tube, an objective at one end thereof, an eye-piece at the other end thereof, and a second eye-piece intermediate the ends of the tube, the optical elements of said second eye-piece comprising a reflector mounted for adjustment either into the path of the rays through the periscope to render said second eye-piece operative or out of the

path of the rays to permit the rays to reach the first mentioned eye-piece. 20

6. In a submarine boat having a conning tower, a periscope comprising a tube extending through said conning tower and mounted for vertical and rotary movement in the upper and lower walls of said conning tower, said tube being provided with an outboard objective, an eye-piece connected to said tube within the hull of the boat without the conning tower inclosure, and a second eye-piece carried by said tube within the conning tower inclosure, said periscope embodying optical means whereby images received by said objective may be viewed through either eye-piece. 25 30

In testimony whereof I affix my signature. 35

ALADAR HOLLANDER.

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