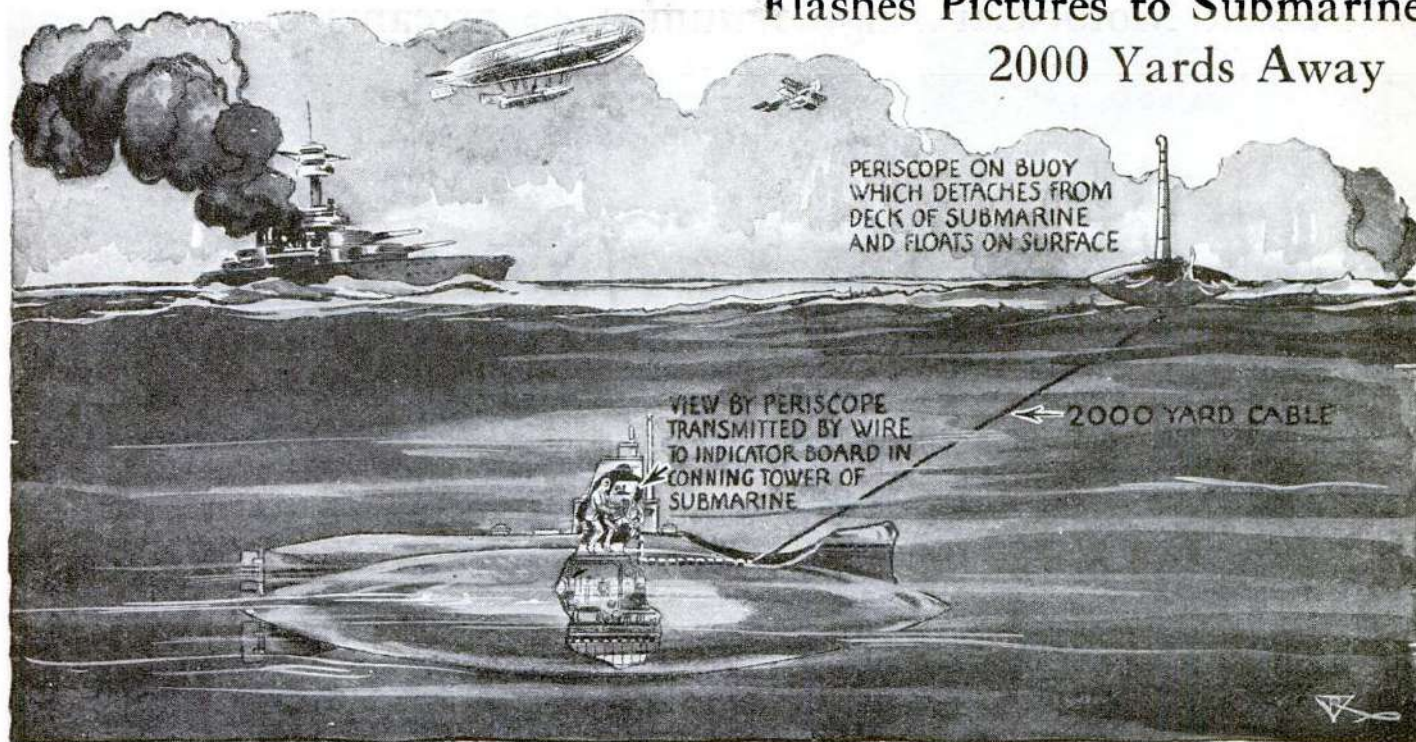


# New Buoy Periscope Sees and Hears

## Flashes Pictures to Submarine 2000 Yards Away



Instead of being an integral part of the submarine, Dr. V. A. Clarke's ingenious electric periscope is mounted on a buoy, which floats 2000 yards from the conning tower when an observation is being made.

When not in use, the device is carried in the superstructure. Pictures and sounds of approaching vessels or airplanes are transmitted electrically to the observers over a copper cable, which also controls the buoy.

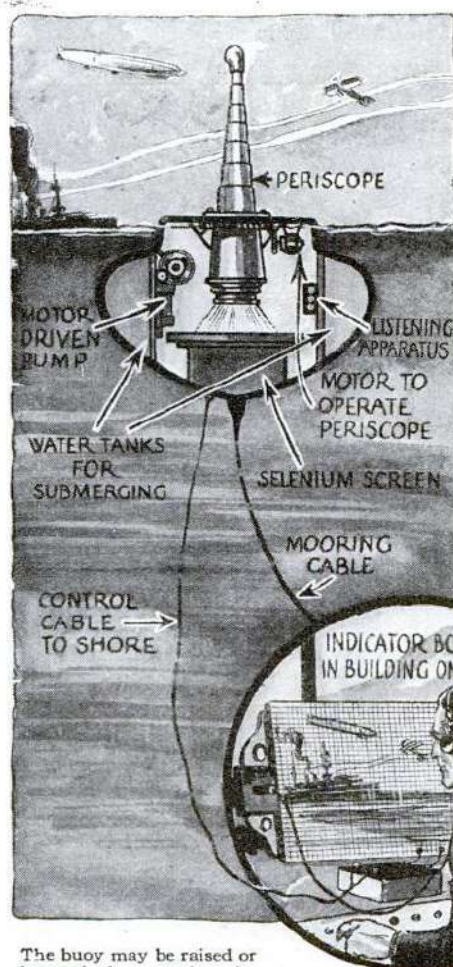
**A**N AMAZING new type of periscope, which floats on the surface far away from the submarine and carries to the latter views of the surrounding sea by means of principles similar to those employed in the radio transmission of pictures, has just been taken under consideration by the U. S. Navy Department.

The periscope is the invention of Dr. V. A. Clarke, of New York City. Its purpose, of course, is to permit a submarine to observe without the possibility of detection by surface ships. According to the inventor, the device doubles the efficiency of a submarine.

The periscope is mounted in a cigar-shaped buoy, about 12 feet long and three feet wide. When the submarine is under way, this buoy fits into a compartment in the superstructure. When an observation is to be taken, the buoy is released, and is towed at the end of a copper cable 2000 yards long.

Electric controls in the conning tower of the submarine permit the periscope to be raised or lowered by varying the water ballast of the buoy by pumping. Other controls operate an electric motor by means of which the device may be rotated through 360 degrees. At 14 feet, its maximum elevation, the periscope's radius of vision is said to be 11 miles.

**B**ENEATH the periscope tube is a series of selenium cells connected with a sort of radio transmitter. An image of whatever the periscope "sees" falls upon these cells, and the variations of light intensity due to the shadows and high lights of this "picture" cause corresponding variations in electrical impulses that pass to the submarine through the copper



The buoy may be raised or lowered by varying its water ballast. At its full height, 14 feet, the range of vision is 11 miles. A microphone and amplifying device transmit sounds to the submarine or to a station on the shore, adding greatly to the submarine's efficiency.

cable. These impulses are received in the conning tower, where they are reconverted into light waves by a reverse of the transmitting process, and viewed on a screen. The images produced in the submarine by this method are said to be accurate enough not only to identify the objects that cause them, but to enable the submarine to fire upon ships seen through the long-distance periscope with every chance of hitting the mark.

**T**HIS type of periscope not only can "see," according to its inventor, but also "hear." The latter operation is effected by supplying the device with a sensitive microphone and amplifying apparatus whereby sounds such as are made by the motors of airplanes or the propellers of approaching ships are heard in a receiver in the conning tower.

The electric periscope, according to Doctor Clarke, would insure safety to the occupants of a submarine by guarding the craft against attack by enemy vessels. If the observer found the periscope surrounded by hostile ships, he would cut the cable connecting it with the submarine, and leave the periscope behind as a blind while the submarine escaped. Doctor Clarke also asserts his invention might be used as an automatic sentinel to warn coast-defense fortifications of coming attack from the sea. His device, he states, can be built complete for about \$15,000. The ordinary telescope type of periscope costs between \$8000 and \$12,000.