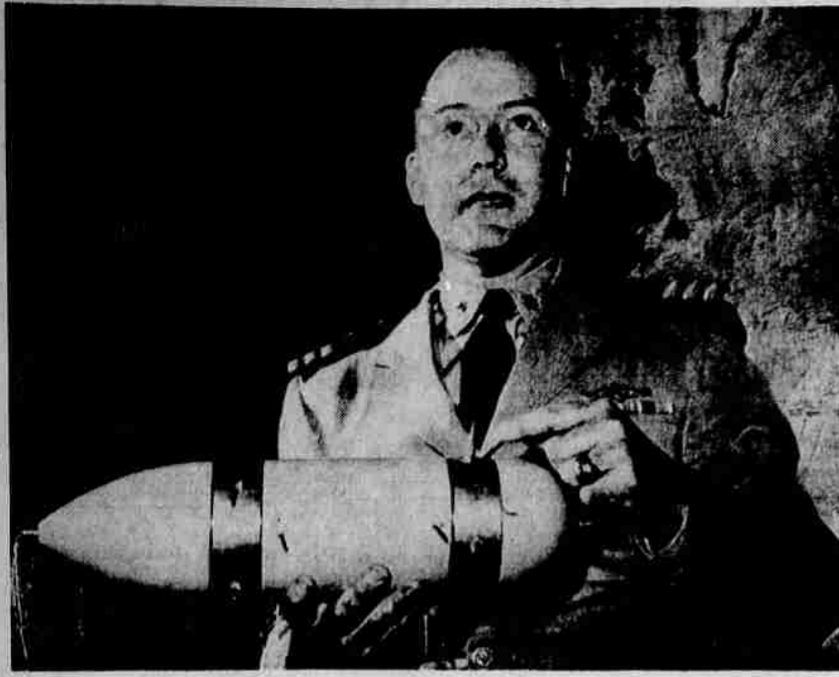


Invention May Hold Key to Conquest of Ocean Depth



EXPLAINS FINS—U. S. Commander Frederick R. Hazelton, Jr., of the Office of Naval Research, is shown here with his scale model of a deep sea submarine. Hazelton explained the fins on revolving rings in an interview.

Washington—UPI—An ingeniously simple submarine propulsion system invented by Comdr. Frederick R. Hazelton Jr. of the office of naval research, promises to provide a key to man's conquest of the ocean depths.

The "Hazelton propeller" is only now in the limelight because of more than three months of fruitless attempts to locate the nuclear submarine Thresher off Cape Cod, Mass.

The Thresher floundered in 8,400 feet of water which is a mile and a half down but substantially less than the 12,451-foot average depth of the seas.

Hazelton, a 1945 Annapolis graduate from Nashville, Tenn., has been working on his idea since early 1961. He has spent nearly \$1 million in Navy funds and expects a joint patent to be issued soon. An 18-foot-long, \$100,000 test model of his submarine is nearing completion.

At present, more than 90 per cent of the ocean's volume is inaccessible except to research vessels like the bathyscap Trieste which operates on the principle of an atmospheric balloon to lower a solidly built gondola containing two or three men.

Though more than 58 feet long, chiefly because of its "balloon" containing 30,000 gallons of lighter-than-water gasoline, the Trieste's spherical gondola is only six feet in diameter. It has been down more than seven miles, withstanding pressures of a pound per square inch for every two feet of depth.

There are more complicated features of Hazelton's invention, but the idea it contains for mastering great depths can be stated in a few words and in terms of the Trieste.

He would place the propulsion machinery outside the hull. Then the hull could be solidly built, with no moving parts, like the gondola of the bathyscap. The structural engineers would still have a great deal of work to do but there is every reason to think that under these conditions the necessary strength for any depth could be achieved.

Hazelton's submarine would need no "balloon," because it would be powered for propulsion in any direction—including up or down, and a sideways movement impossible for present submersibles.

Speed would at least equal that of present types and probably would become greater rather than less with depth because of reduced cavitation (a partial vacuum in fluid around a revolving propeller). It is generally accepted in the Navy that submarines are rapidly approaching the day when they will travel much faster than surface ships.

The Hazelton submarine would have no propeller in the usual sense. Instead it would have two huge, counter-rotating "rings," placed like rings on a finger near either end of a cigar-shaped vessel.

The rings would be driven by electrical motors which would draw their power through solid cables from the sub's nuclear reactors. The motors, outside the hull, would be operating in sea water—a horrible thought in terms of old-style maintenance. But Hazelton has word from the two biggest U.S. electrical companies that modern technology makes this possible.

Hazelton told UPI in an interview that if he gets a go-ahead from the Navy his submarine could be operational in six or seven years at depths about double the present maximums, which are secret but probably not much more than 1,000 feet.

Solution of the structural problems for really great depths might take several more years. Hazelton said aluminum and fiberglass at present look more favorable than steel because the strength-to-weight ratio is greater.

The 18-foot model, under construction at the Netherlands ship model basin in Wageningen, Holland, and due to arrive in this country next October, has space for a test pilot but in the absence of a nuclear reactor naturally can't be self-propelling.

It will operate on power brought by cable from outside the tanks at the David Taylor model basin outside Washington. The model's chief function is to test unique hydrodynamic characteristics.

Bills Would Protect Servicemen's Rights

Washington—UPI—Sen. Sam J. Ervin Jr. (D-N.C.) has offered 18 bills designed to protect the constitutional rights of servicemen. Included in the group are bills to abolish summary courts martial, and to require trained legal counsel in any proceeding that could result in a dishonorable discharge.

Mounted on each of the revolving rings are a dozen or more short fins which, in a full-scale submarine would be two to three feet long and which vary their pitch with each revolution. These are adjustable for propulsion in any direction.

The fins also are adjustable for stationary stability in any position. In other words, the submarine could stand upright in the water to launch large missiles if this were desirable. There would be no mechanical obstruction to launching missiles or torpedoes from either end of the hull.

Hazelton, who already speaks of the existing nuclear subs as conventional types, explained that torpedo tubes, escape hatches and the like, containing no moving parts, do not present the type of structural problem encountered when hull openings are necessary for revolving propeller shafts.

He was, however, conservative about the depths that could be reached with present materials and structural methods. Using steel in a normal

size submarine, he said, the "hull fraction"—the fraction of the weight in the hull—would become intolerable at considerably less than 15,000 feet.

The oceans, which the Navy likes to refer to as "inner space," go down in many areas to more than twice that depth and, in a few deep trenches in the Pacific, to more than 37,000 feet. It's Hazelton's guess that, with outer space being tamed, no one will be satisfied until submarines can reach any sea bottom in the world and re-surface.

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The Family Council

Editor's note: The Family Council consists of a judge, a psychiatrist, three clergymen, three editors and a women's editor. Each article is a summary of a family disagreement presented to the Council. The Council deals with problems, major and minor, encountered by guidance counselors and social workers. Edited by Mrs. Alma Henry. (Copyright by General Features Corp.)

Mrs. G. K.—We should all try to cheer him up.

Vera K.—He's just a Gloomy Gus and nothing will help.

Mrs. G. K.—We've raised two children and have two more at home—Bill, our baby, who's 10, and Jeff, our teenager of 15. Their older brothers is in the Air Force, and Vera, our only daughter, is in training as a nurse. It's Jeff who has me stymied. He's so worried about marks that he's at summer school to raise a B to an A. He skips meals, studies constantly, never smiles—I hope he doesn't break down.

Vera K.—Jeff's mopey face sure spoils the scenery at home. Bill is solid sunshine, and the rest of us are pretty relaxed and flexible. But Jeff is a bunch of nerves. My mother scolds me for kidding him, because he flies off the handle at any light talk. Just because my older brother and I never got many A's in high school, Jeff wants all A's and considers anything less a falling

Fichtner Warns of Glancing from Road

Acting Police Chief Clyde Fichtner issued a reminder today to all persons who will be vacationing in August to stop before starting to enjoy the scenery.

A vacation can be ruined, he stated, by inattention to see the scenery is to find a wide shoulder or viewpoint.

Even a brief look at highway speeds can be fatal, Fichtner emphasized. At 60 miles an hour a car moves about 350 feet with every normal breath of the driver, the officer explained.

"Look away to admire the scenery for just two seconds," he added, "and you've traveled 175 feet."

The people of Brittany are of Celtic descent. seems dangerously so—in need of clarification, support, understanding. His family can help him get it. "I am the most miserable man living," wrote Abraham Lincoln to a friend. The latter, with others, remedied that.

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Nalley's POTATO CHIPS Jumbo Triple-Pack BOX 55¢	"CHOICE" AGED BONELESS BEEF ROASTS 98¢ lb
"WHITE STAR" CHUNK STYLE TUNA Large Tin 29¢	"CHOICE" GENUINE SPRING LEG 0' LAMB 79¢ lb
"Ritz" Crackers 2 1-LB. PKGS. 79¢	WILSON'S Vienna Sausages 6 TINS \$1.00
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