MARINE ENGINEERING

Two-Ton Diving Ball For Use In Deep Sea Salvage Tested

Able to Withstand Pressures 2,500 Feet Under Sea, Ball Has External Arms Which Can Even Tie Knots

A TWO-TON diving ball, commercial counterpart of the Beebe-Barton bathysphere, has arrived in Washington to show officials, both Federal and foreign, the newest methods of undersea salvage.

Already tested at depths greater than 800 feet, the five-foot steel sphere has been officially called by Navy inspectors "the greatest invention since the diving suit."

For the next month the diving ball will be aboard the "Constellation," four-masted sailing ship now anchored at Washington's waterfront.

Developed by the Romano Salvage Corporation of Seattle, Wash., the diving ball holds the following records of accomplishment: Steel railroad gondola car raised 485 feet from the bottom of Puget Sound in five and one-half hours. Raised, as a test, a tug weighing 220 tons from a 310 foot bottom. Descended to 852 feet to test undersea lights and operation.

Designed primarily for work below the range of ordinary diving suits at 300 feet, the new device is intended for use in deep-sea salvage operations, for rapid raising of sunken submarines and for sponge fisheries. More romantic, but of less immediate interest, is the raising of some part of the $2,000,000,000 in gold known to lie at the bottom of the seven seas in ships which sank at intervals from the days of the Spanish Main to the World War.

The Romano diving ball is made of steel sufficiently strong to stand pressures 2,500 feet below the surface of the sea. It owes its usefulness to a variety of arms operated from within. Twelve different "gadgets" can be attached to these moving arms six feet long. With them the operator can lift objects weighing 1,000 pounds, tie knots in one and one-half inch steel cable, drill holes up to three inches in diameter through ships' plates and perform a variety of other tasks which a diver needs to do beneath the water.

Operated hydro-pneumatically, the arms can lift great weights and yet are so delicate in their movement that, as a test, a man within the ball has "made a fourth" at bridge, picking up and laying down his cards as needed.

Provided with an oxygen tank and an absorbing cell for carbon dioxide given off in respiration, the operator within the ball can work for twelve hours at a stretch, always under normal air pressure. When returning to the mother ship above there is no long delay to equalize air pressure and thus prevent the diver's menace—the "bends."

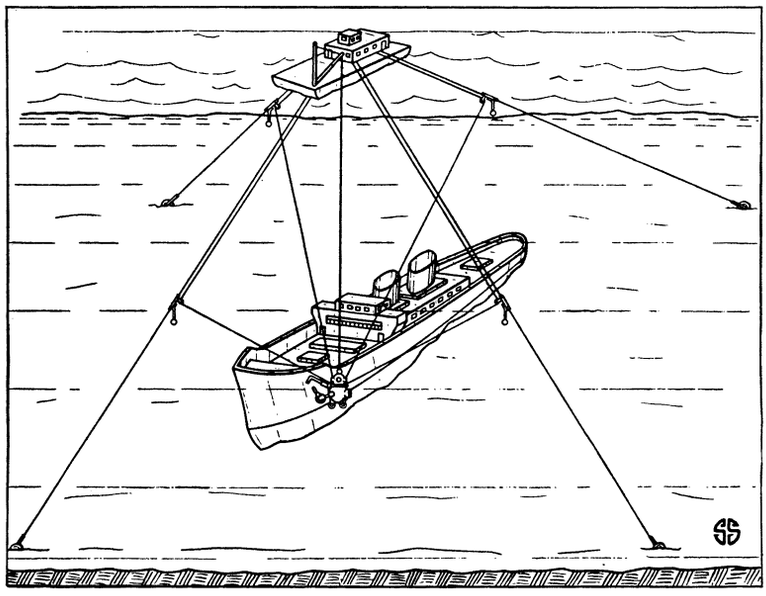
Telephone communication is provided with the ship on the surface through which the movements of the diving ball are accurately controlled.

In operation, four anchors with attached cables are sunk at the four corners of a given area, which may be 1,000 feet on a side. The four lines thus fixed meet overhead at the mother ship. From the underwater tent-like cable structure hangs the diving ball. From the mother ship the ball can be moved up, down and sideways over any part of the bottom under inspection.

For working in the inky blackness of the depths special electric lights are provided that illuminate the bottom for fifty feet around the ball.

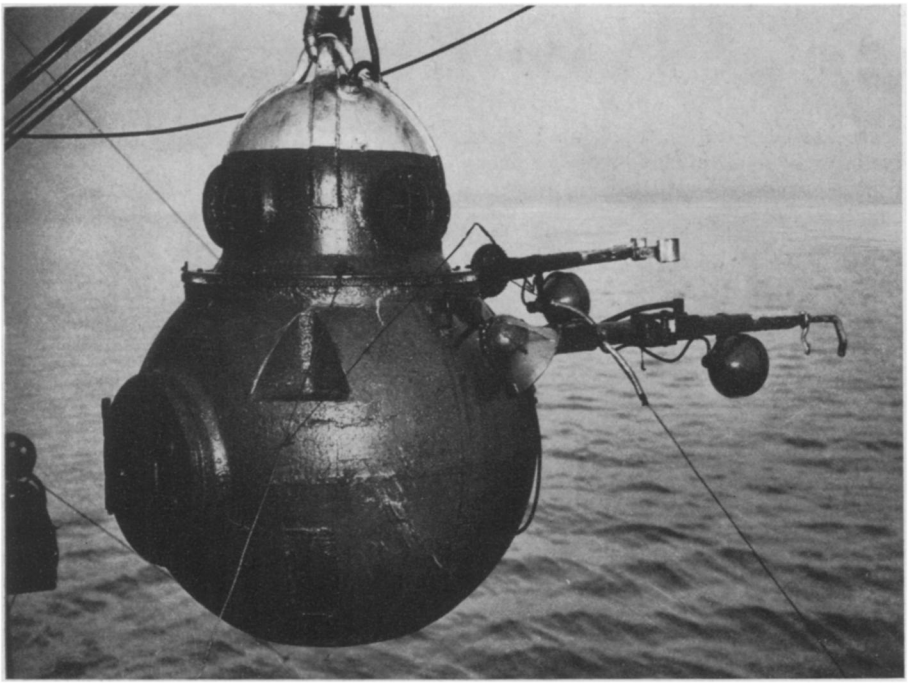
The main function of the device is to attach cables to the sunken ships, down which great tanks, each capable of lifting 100 tons, can be sunk to the body of the wreck. Open at the bottom, these tanks are filled with water, and hence do not have to withstand the enormous hydrostatic pressures. When in place, over the wreck, air is pumped into them until they attain a positive upward buoyancy. At all times the pressures inside and outside are equal. It is only necessary to attach sufficient tanks to the wreck to lift more than its total weight. Once they are filled with compressed air from the surface, the wreck either comes up or tears itself apart.

An application of interest to the Navy is the raising of sunken submarines. As planned, each submarine would have, under its decks, small marking buoys with several hundred yards of cable. When it sinks to the bottom the crew within would release these marking buoys which would rise to the surface, carrying up the cable, and set off marking flares.



RAISING SHIPS FROM THE SEA

The dragline system by which the new diving ball salvage apparatus moves over a wide area under water. Four cables are fixed by anchors over a region of sea bottom and meet at the mother ship on the surface. Suspended from these four cables by four others is the diving ball whose vertical and horizontal motions are accurately regulated from the mother ship. Telephone communication instantly directs the location of "ball" which by drills and clamps affixes buoyant tanks to the submerged wreck. At one "station" of the mother ship two square miles of ocean bottom can be quickly "worked" by the ball.



COMMERCIAL "BATHYSPHERE"

The rescue ship simply slides the large buoyant tanks down these cables to the submarine and then pumps in air until the tanks raise the sub. Sufficiently strong eye-bolts in the body of the sub would be built into place at the time of construction and the whole raising operation, it is estimated, could be accomplished in a few hours.

For sponge fishing the Romano diving ball has interest because it can operate for long periods below the range of present divers in rubber suits. The world's supply of good sponges is reaching lower and lower depths all the time. Dragging operations, now used in some regions, are unsatisfactory since the sponges are torn in the process. Somewhat like flowers, sponges ought to be "picked" for best results.

Then in the background of usefulness are the treasure ships of the world which ever excite the imagination with the wealth potentially present. Lieut. Harry E. Rieseberg, commanding the sailing ship Constellation from which the Washington demonstrations will be held, is an authority on the location of such ships. His world charts show scores of them lying on the bottom at depths of only 400 or 500 feet. They are just below the range of present diving equipment but well within the operation limits of the new diving ball. Along the Spanish Main, through the Mediterranean Sea, and even in Inca-sailed lakes of South America are said to be fortunes in gold and silver awaiting the coming of man to bring them to the surface.

Science News Letter, May 18, 1935

GENERAL SCIENCE

Science Service Board Elects Three New Trustees

THREE new trustees of Science Service, the institution for the popularization of science, were elected at its recent annual meeting: Dr. Harlow Shapley, director of Harvard College Observatory, representing the National Academy of Sciences; Dr. Henry B. Ward, permanent secretary of the American Association for the Advancement of Science, representing that organization; Dr. Ludvig Hektoen, director of the John McCormick Institute for Infectious Diseases, representing the National Research Council.

Dr. Vernon Kellogg, secretary emeritus of the National Research Council, who retired as a trustee, was elected honorary vice-president in appreciation of his long service in the office of vice-president.

The following resolution was adopted upon the death of Dr. David White, formerly of the U. S. Geological Survey, who was a Science Service trustee.

RESOLVED, That the Board of Trustees of Science Service desire to express their sincere feeling of sorrow and personal loss in the death of Dr. David White. His long and valuable services as a Trustee, as a member of the Executive Committee and as Chairman of the Executive Committee are recognized and deeply appreciated by his fellow members as constituting an important factor in the successful initiation and development of the work of Science Service. It is ordered this resolution be entered upon the minutes of the meeting of April 25, 1935, and that a copy be sent to Mrs. White.

Trustees re-elected were: Dr. R. A. Millikan of the California Institute of Technology, representing the National Academy of Sciences; R. P. Scripps of the Scripps-Howard Newspapers, representing the E. W. Scripps Estate; Marlen Pew, editor of Editor and Publisher, representing the journalistic profession.

Dr. J. McKeen Cattell, editor of Science, was re-elected president. Other officers re-elected were: Dr. W. H. Howell of Johns Hopkins University, vice-president and chairman of the executive committee; H. L. Smithton of Scripps-Howard Newspapers, treasurer; and Watson Davis, director of Science Service, secretary. Dr. C. G. Abbot, secretary of the Smithsonian Institution, and Mr. Pew were re-elected members of the executive committee. Dr. William E. Ritter of the University of California is honorary president of Science Service.

Annual reports of Science Service for its fourteenth full year of operation ended March 31, showed that news and interpretations of scientific progress are furnished over 6,000,000 readers through newspapers utilizing Science Service news and feature reports, issued by telegraph and mail daily, weekly and monthly.

The weekly magazine of Science Service, the SCIENCE NEWS LETTER, gained distribution and currently has over 16,000 circulation.

Various books and magazine articles written and edited by members of the staff were produced during the year, notably the book, "The Advance of Science." Two radio talks each week were arranged by Science Service during the year over nationwide networks of stations.

Progress was made toward an extension of Science Service activities in the British Empire, and a working arrangement for the exchange of news with Tass Agency of the U. S. S. R. was made.

Research aid activities consisting of the collection of earthquake information, the distribution of cosmic data, and the investigation of archaeological and anthropological discoveries were continued.

The cost of operation of Science Service during the year was slightly over $110,000, about three-quarters of which was income derived from product.

Science Service was organized in 1921 as a non-profit corporation charged with the broad work of science popularization.

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