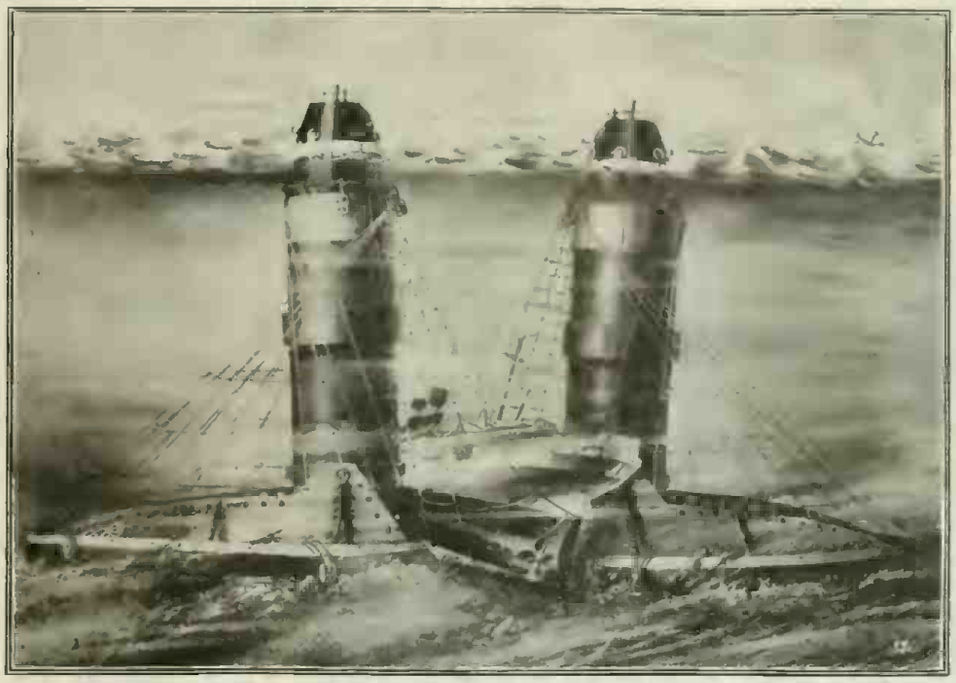
Powerful Hydro-Electric Salvage Apparatus to Raise Sunken Ships

By H. Winfield Secor, Assoc. A. I. E. E.

POSSIBLY more than one enterprising inventor of to-day has conjectured on the problem of raising some, if not all, of the hundreds of torpedoed steamers which lie scattered along the European coast in comparatively shallow water, not to mention the many sunken ships lying within the coast boundaries of our own country. It is not often that we hear of a sunken ship being floated and brought into dry-dock for the reason that the cost of performing such an engineering feat is generally prohibitive, and also in many instances, the problem of raising the sunken vessel at all has practically been beyond solution.

Now comes an American inventor, of Swedish birth, one Mr. Carl Linquist of New York, and formerly of the Swedish Navy, who has devised a remarkable new scheme for raising sunken ships of no matter what size, as long as they do not lie in too great a depth of water, and which idea he intends commercializing at an early date.

It goes without saying that if Mr. Linquist's idea, as outlined herewith, proves feasible and successful, that he will find plenty of work for several years to come.



After the War There Will Be Thousands of Vessels Lying on the Oceans' Beds. If Only a Fraction of These Can Be Floated and Repaired, Think What It Will Mean to Commerce. A New Invention Intended to Accomplish This Purpose Is Illustrated Here and Involves the Use of Two or More Powerful Cylinders Which, as They Are Emptied of Water and Made More and More Buoyant, Finally Exert Sufficient Upward Pull on the Cables to Lift the Vessel.

The inventor's idea involves the use of two or more telescopic cylinders or chambers as shown in the accompanying illustration, which are attached thru massive universal joints at their bases to the large horizontal submerging chambers or "feet" which rest on the bed of the ocean or lake. In the first place, it is of course paramount that the exact location of the sunken vessel be known. Having this information, the salvage expedition sets out from the nearest port with the necessary number of these large collapsible cylinders with their attached base members (or "Forts" as their inventor calls them). The vertical cylinders shown lie horizontally, and as do also the base members, which are made to float, and the vertical and horizontal sections double up like a jack-knife, permitting the several units of this equipment to be towed by tug boats to the scene of the wreck.

The present plans of the inventor consider that salvage operations may be successfully carried on for any size vessel in depths of water up to three hundred feet, and where necessary four to eight or even more of the raising cylinders are employed, placing an equal number of them on each side of the sunken ship.

Supposing that several units of the salvage equipment are ready and floated to the position where they are to be used, the engineers then proceed to fill the base member with water causing it to sink. As it does so, the upright cylinder naturally assumes a vertical position, and moreover the base member obtains a very powerful hold on the bed of the ocean or harbor by "sand-suction," besides the heavy water pressure bearing down on its outer surface. A number of strong cables are let down in the water, and with the aid of an operator inside the inner pontoon who directs the work, these cables are swept under the hull of the sunken vessel. When all of the cables have been properly placed, the engineers are ready to begin operations for raising the wreck. Here is where the remarkable genius of Mr. Linquist comes into play, for he does not attempt to raise the ship by means of steam or any other form of engine. He has called upon Dame Nature herself to furnish the wherewithal to raise any ship, no matter what the size. In brief, what he does is this:—

The upper telescopic and movable cylinders rising within the vertical floating chambers and guides, they are allowed to fill with water from the ocean itself, and as will be seen these will then sink to any required depth. When they have submerged until their upper structure is just above the water, the valves are closed, and by means of powerful electric pumps (in case the operations take place a considerable distance from shore, gasoline engine-driven pumps are available), the water within the movable upper cylinders is rapidly pumped out. But a moment's reflection is required to at once see that these upper cylinders will naturally become steadily more and more buoyant, and providing they are built of the proper size for the work in hand, they will exert a tremendous lifting power of thousands of tons. After these cylinders have gone up a suitable distance the lines are caught by the stationary vertical member and the ship is thus held while the floating cylinders re-fill and take a new bite; the same operation is then repeated to the surface.

Mr. Linquist intends building these cylinders, not of steel but of narrow strips of wood several inches thick, or steel may be used in certain cases. The wood strips are tongued and grooved and caulked and are held in shape by steel bands. The pressure of the water on the outside of the cylinders will in consequence tend to always tighten them, as becomes evident.

The inventor has broached and demonstrated by means of models, his unique idea to a large number of sea-going men, including commanders of salvage squadrons, and also to a number of naval men, and has received unqualified recommendations from these men, who should be qualified to judge as to the efficiency or inefficiency of such a device if anyone could. Not only is this idea of considerable promise and utilification in salvaging sunken vessels in times of peace, but it possesses according to Mr. Linquist, several valuable naval features. For one thing he has suggested that one of these hydrostatic units would prove very efficacious in the rôle of a "Submarine Base," the outfit being anchored several hundred miles from shore stations if desirable. Also they would serve as a resting place for the crew.

The inner cylinder would have a large capacity for the storage of oil and gasoline for submarines, and in the event of being sighted by a hostile war vessel, the upper cylinder and super-structure could be submerged so as to be invisible, and the inventor claims that no force, even the ocean itself, cannot budge his suction foot member an inch, once it has got its grip on the bed of the ocean by natural "sand-suction," and besides most of the floating member lies in calm water, the action of the waves not reaching very deep. A means is provided for releasing this all-powerful grip upon the ocean-bed when it becomes desirable to move the unit to some other location. U. S. Naval Officers have been favorably impress with this idea.

In closing, it is interesting to note that another valuable possibility of this device is that of releasing stranded vessels which

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a clear glass jar, A. (See diagram.) Into the bottom of this jar some bitumen is poured while in a hot condition. This serves to fix the porcelain base, B, in position. This base forms the support for the sack, C, keeping it in a central position, and also a support and spacer for the zinc cylinder, D, keeping it always the correct distance from the sack. It is this narrow space between the zinc and the sack which, to a large extent, makes the internal resistance of these cells so much less than Lechanché batteries. The top of the sack has a rubber ring, E, round it in order to further safeguard against the zinc cylinder touching the sack. Above the sack a specially shaped porcelain ring, F, is slipt over the carbon rod, G, and this serves as a support for a waxt cardboard disk, H, which supports the sealing compound. Two holes are arranged in the sealing compound and the cardboard washer; in one of these is a fiber tube. This tube forms the funnel thru which the water is poured when the cell is required for use, and is normally sealed with a cork. The other hole contains a small glass tube to allow the gases generated when the cell is in action to escape. A lead connection strip, J, is soldered to the zinc cylinder, and this is brought up at the side of the cardboard washer and thru the sealing compound. This lead strip is provided with a punched hole to allow of connection to an adjacent battery. A brass cap, K, is forced on to the carbon rod, and the nut for wire connections screws on to a pin riveted and soldered to the cap. The ammonium chlorid crystals, L, are placed in the cell at the time of manufacture; so that all that is necessary to make the cell ready for use is to remove the cork, fill the cell with water, and replace the cork.

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may have gone ashore in shoal waters. Supposing that a vessel has become embedded in the sand. Upon arriving at the scene with one of the Linquist hydrostatic lifting units of the type already described, this is set up out in the deep water at a considerable distance, say one thousand to 1,500 feet from the vessel in distress, and a heavy cable is attached to the oceanward side of the vessel. In certain cases, and when necessary a line may be shot over the vessel to carry out this part of the operation. The cable which is secured to the stranded vessel is carried from the Linquist apparatus, and passes thru two large pulleys secured to a stationary truss on the base of the "fort," and in proximity to the vertical member of the lifting apparatus. The free end of the cable is secured to the top of the telescopic movable cylinder of the Linquist device, and this is made to rise by becoming more buoyant thru the agency of the electric pumps (supplied with electric power from the lines on shore), water being pumped out of the movable telescopic cylinder causing it to rise, and when this occurs a force of thousands of tons is brought into play, giving sufficient upward pull on the cable passing thru the stationary pulleys to haul the vessel off the shoal.

The inventor of this truly remarkable scheme for raising sunken boats, etc., says that if his device had been available at the time the U. S. Submarine F-4 sunk in the Honolulu harbor some time ago, that he could have raised the submarine in *four days* instead of taking four months, which was the time required by the only method available, when this deplorable accident