

Robbing the Ocean of the Prey of the German Submarine

Ships and Cargoes Valued at Billions of Dollars Carpet the Sea's Floor

By Wilbur Forrest

ALTHOUGH British salvage companies, working under the direction of the British Admiralty, already have been able to raise and reclaim some 500 of Britain's 6,000 lost ships, science and invention, which usually keep pace with modern necessity, have thus far failed to solve the sternest salvage problem the marine world has ever faced.

The problem involves the possibility of raising the giant Cunard liner Lusitania and ships of her bulk desperately needed in sea commerce. The Cunarder, which New York used to know so well, lies to-day off the Old Head of Kinsale, on the Irish coast, under about 290 feet of water. The angry waves that roll over the scene of the world's most tragic sea crime are frequently whipped by wind squalls and storms, making attempts at salvage with modern machinery and proved methods a most hazardous and seemingly impossible task.

Sunken Wealth

One marine statistician has estimated that the floor of the ocean, if man were to devise the practical means, could be made to give up some \$8,000,000,000 worth of ships and cargoes sunk alone during the four-year period of the European war. British ships salvaged since the armistice are valued in the neighborhood of \$250,000,000. Many of these craft are again to-day sailing the Seven Seas carrying on British commerce. One organization, the London Salvage Association, has charted and marked out 120 ships which it is expected will be raised from comparatively shallow depths within the next twelve months.

Charted wealth far beyond the dreams of even present-day avarice has caused the formation of sea salvage companies in numbers and with combined capital stocks running into many millions of dollars since November, 1918. Ship raising has been a topic of absorbing interest to the layman and of animated discussion in the marine world for many months, inspired by the enormous war profits of Neptune, Mars & Co., together with the crying need of sea tonnage to carry on the commerce of the world. World shipping lost more than 15,000,000 tons of bottoms during the European war through accident and such malign agencies as the mine and submarine.

Raised Easy Ones First

Up to now, however, marine salvage experts have directed their energies toward picking the apples from the lower branches first—reclaiming the easier wrecks in shallow and sheltered waters. Great projects, like bringing such hulks as that of the Lusitania to the surface, have been reserved for scientific discussion only.

When New Yorkers literally lined the shores and blackened the windows of lower Manhattan in September, 1907, to witness the sleek ocean greyhound Lusitania nose her way up from the Lower Bay on her maiden voyage after smashing all transatlantic speed records, little did they realize that to-day she would constitute a marine salvage problem—a blackened barnacle-covered hulk, a gruesome ocean bier for some 1,150 persons who boarded her on May 1, 1915, at New York for Liverpool.

Just seven years, seven months and twenty-three days after the graceful leviathan first arrived at Sandy Hook, to be greeted all the way up the harbor and into her river berth by shrieking whistles of hundreds of craft and watched by thousands of admiring folk, she dipped her sharp prow into the waters of the Irish Sea and plunged to the bottom. One or possibly two German torpedoes transformed the great liner into a hulk which now causes the marine world to talk vaguely of her reclamation. Nine million dollars' worth of ship, possibly some twelve million in gold bullion and almost another million worth of ordinary cargo were lost, not to mention the hundreds of precious lives.

Marine men have scoffed at almost every theory yet advanced for the raising of the Lusitania. Her giant self, her golden cargo and the very bones of the victims within her, by all the laws of the sea, belong to those who shall bring her back to the surface. There have been none so far to dare the job. Methods on paper have been numerous. One ambitious theorist suggested chopping the great liner into pieces and reclaiming her piece by piece. Salvage experts, however, point out that this person failed to take into account the impossibility of divers tackling such a feat with subsea acetylene torches where water pressure is something like 120 pounds to the square inch. Even in shallow water, the experts say, the rending into parts of a great steel hull like

that of the Lusitania would be an almost insurmountable job.

Schemes Are Numerous

Some conjecturists have advanced the feasibility of constructing rigid pontoons as large as the Lusitania herself and lifting the ship between them by means of steel chains secured to the hull. Marine engineers again interpose that the depth at which the Lusitania lies and her great weight, now partially buried in sand, would preclude such a feat even if the pontoons were not torn from their moorings and battered together and smashed by the sudden storms of the Irish Sea.

Perhaps half a hundred schemes for raising the Lusitania have been brought forward in the last two years. All but a very few have been swept aside by marine salvage experts, and the others have been rejected because of the enormous expense involved. But invention and experimentation may yet solve the problem, says Captain Woolsey, a leading marine engineer of New York, who has had long years of experience in ship salvaging along the Atlantic coast. In his office, at the firm of Merritt & Chapman, 17 Battery Place, Captain Woolsey said:

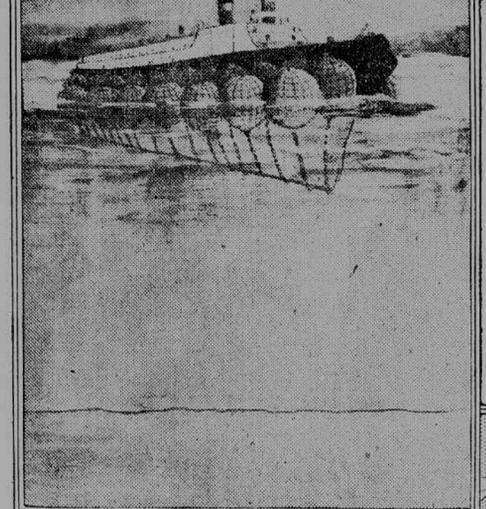
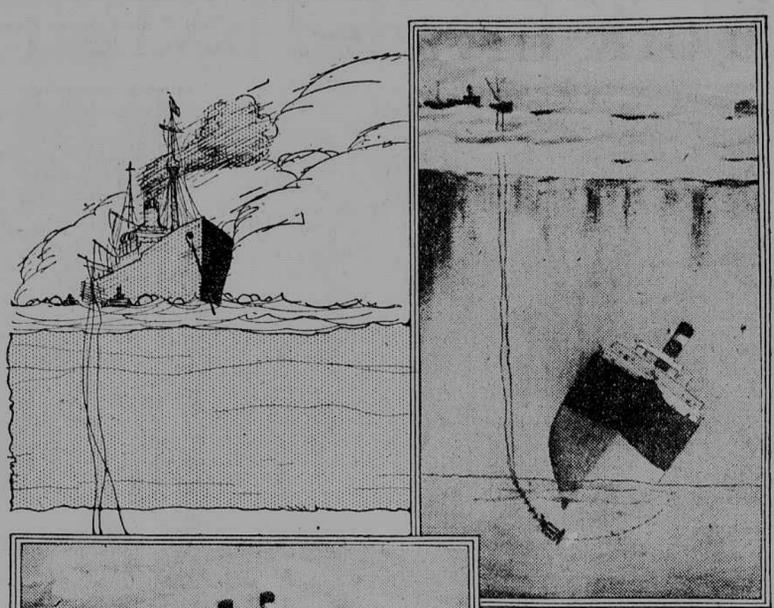
"It would be ridiculous for any one to say that the raising of the Lusitania is an impossibility. But don't ask me to say how it will be done. Invention is making such rapid progress nowadays in all lines that it is folly to say that anything is impossible. However, the Lusitania is a great hulk, and no one knows the exact damage done to her hull. The greatest number of those who have volunteered ideas regarding her recovery and the means to do it have had little sea experience. According to soundings, the Lusitania lies in at least 280 feet of water, and considering that water pressure is fifteen pounds to the square inch at sea level, even the layman can get an idea of the terrific pressure with almost 300 feet of water above. I can advance no practical theory which would make the salvage of the Lusitania possible, but I am mightily interested in the subject and look forward with keen interest toward some method still untried."

Three days after the big Cunarder went down Marine Superintendent Dodd of the Cunard Line at Queens-town said that the liner would never be raised. The marvelous ability of the British Admiralty, demonstrated in a hundred ways during the war, seems also to have been balked by the problem of the Lusitania.

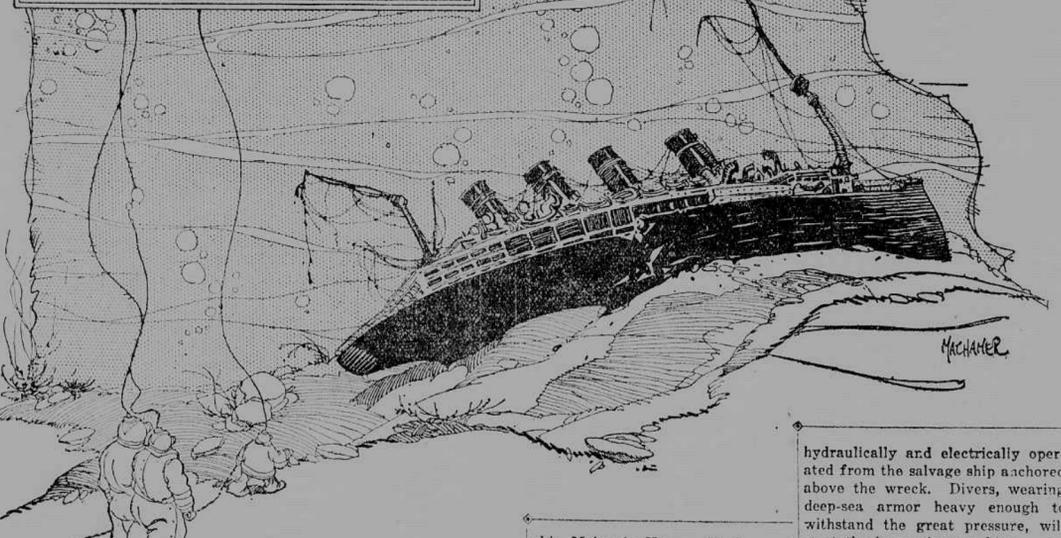
New Yorker Has a Plan

Contrary to all pessimism, however, a New York inventor is one of the latest to believe that he has devised ways and means which will float the giant Cunarder within the next fourteen months. He is A. B. Saliger, president of the Saliger Ship Salvage Corporation, 542 West Twenty-third Street. Saliger's proposed method is unique. Surface controlled burrowing machines which will carry heavy chains under the hull and deflated small pontoon bags used in quantity to exert a lifting power sufficient to carry the hulk upward, while cradled in the chains, is a thumbsketch description of the proposal.

Only three practicable and accepted means of raising ships have been employed by sea salvage men



ONE of the many plans proposed for the raising of the Lusitania and other ships is that devised by A. B. Saliger, a New Yorker, who has invented a machine which will burrow under sunken vessels, carrying chains to which balloon pontoons will be attached. The plan is to be tried soon on a vessel sunk off the New Jersey coast. If this effort is successful its promoters say they will be ready to tackle the Lusitania



for the last sixty years. Before that period most all ships were of wood and salvaging was a surface proposition. The modern steel ship floats, not because it is lighter than water, but because it displaces a

greater weight of water than its own weight and the weight of the cargo. Once the hull is pierced it goes down like a stone. However, once under water the surface or air weight of any object is decreased, just as the bather notices his buoyancy in the surf.

tackle and pumped out. A third system comprises the use of wood or metal pontoons, of either surface or submerged type, which are fastened to the wreck, utilizing the force of the tide or of compressed air to do the lifting.

All known salvage methods are extremely hazardous and impossible unless carried out in comparatively shallow and sheltered waters. All of them are costly.

Attempt Within a Year

The New York inventor's methods are none of these, and it is his claim that ship salvage will become an accomplishment at depths hitherto impossible, irrespective of the elements and at a cost far less than involved by any known method. One of his first tasks, he announces, will be to raise the United States Shipping Board steamer Frampton, rammed and sunk a short time ago off Atlantic City. Success here, he believes, will bring about the means to go after the Lusitania. This operation, according to R. D. Sheldon, vice-president of the Saliger corporation, will be attempted within the year. Says Sheldon:

"We expect to raise the Lusitania intact so that she may be put back into commission. Proper authorization and the chartings from the British Admiralty are all that are necessary, because we have the system which makes it possible not alone to raise the Lusitania but any number of ships lying at such depths hitherto making their salvage impossible."

Explaining the Saliger system, Mr. Sheldon said that to lift the Lusitania it will be necessary to cradle her with at least 500 heavy lifting chains. These chains would be carried under the hull through sand, or whatever the ship is lying in, by patented digging machines

The Big Adventure That Attracts Seamen's Imagination Is Raising the Lusitania

the entire hull is cradled. Then come the pontoons, lowered and guided into position by the light wire cables. Divers make them secure to the chains and compressed air is sent down to inflate them.

Special Pontoons

"We have tried out our apparatus and it works 100 per cent perfect," said the Saliger Corporation's vice-president. "With the 500 lifting chains in place and with 1,000 of these specially constructed pontoons attached and inflated, there is no power in the world that will keep the Lusitania from floating. We believe that we can bring her up so that she can be towed immediately to a drydock with perfect safety.

"Each of the pontoons, or rather large footballs, has a lifting power of twenty-five tons. The weight of the Lusitania with her underwater buoyancy cannot be more than 25,000 tons. All the apparatus used is extremely simple. It is what might be called a unit system apparatus. It is all light tackle and works unit by unit. For example, you are unable to carry a ton of brick but you are able to transfer that ton of brick one brick at a time. The chains to be put under the Lusitania's hull are to be placed one at a time. Divers simply attend to the operation. When one is placed and there are no involved complications, the operation is repeated. The lowering of the deflated pontoons is equally simple. When sufficient of these deflated 'footballs' are sent down and made fast to the chains, the compressed air is sent down through tubes, with which every 'football' is equipped. Their lifting power and the weight to be lifted are a mental mathematical calculation. When enough of them have been inflated 'the ship will rise.'

These special "football" pontoons, now being manufactured in New York, are approximately twelve feet in diameter and spherically designed in order to withstand the greatest water pressure. Each weighs in air about 650 pounds. Special air-pressure valves are used. The inner skin is of heavy rubber. Tough marine sail canvas covers the rubber and the two are riveted together. Over both is a meshing of the heaviest weave of Manila hemp. As compared with any salvage pontoon ever used these bags are small, resilient and designed by their constructors to live in any storm and protect their quarry once they have brought it to the surface.

500-Pound Suit

The diving suit to be used at depths where water pressure is severe, as at the level of the Lusitania, must weigh about 500 pounds, and, in addition, be weighted with lead at the feet. When lowered into the water in one of these deep-sea contraptions the diver is utterly helpless until a certain amount of weight has been offset by tons of pressure. A diver equipped with the ordinary rubber suit cannot descend much more than 100 feet for fear of the pressure tearing the rubber and causing death. On the other hand, the heavy armored deep-sea outfit becomes a mechanical possibility only with pressure, when the

man inside may manipulate his mechanical arms and walk stiffly about. In what position on the ocean floor deep-sea divers will find the giant Cunarder is wholly a matter of conjecture. She was struck amidships by a torpedo, or two of them simultaneously, and remained afloat with list toward her wounded starboard side for eighteen minutes before she nose-dived rapidly.

According to the testimony of Captain Turner at the official inquiry in London all of the 175 watertight bulkheads of the Lusitania's hull were closed at the time of the disaster. With this a fact, marine men are inclined to believe that she lies to-day on her starboard side, drawn to that position in settling by the added weight of water rushing in when she was struck. It is also regarded as possible that a lifting force of 25,000 tons may not be required to float the ship, as many of these bulkheads may still inclose the air which was imprisoned in them over five years ago. These would supply added buoyancy and make the task as outlined in the Saliger project an easier one.

Was 790 Feet Long

The average reader may, however, gain some clear idea of the massive bulk of the sunken Cunarder and commiserate somewhat with the marine engineers who regard her recovery a dubious task, by a glance at dimensions. The former champion racing greyhound of the Atlantic measured 790 feet from bow to stern, with a beam of 83 feet. The construction of hull alone required 28,000 steel plates, many of which weighed five tons. The rivets used to join these plates aggregated 500 tons. There were four big propellers, each weighing in the neighborhood of 30 tons, and the rudder was a matter of 65 tons. Three anchors weighed 10 tons each.

The great ship was built on the Clydebank, in Scotland, by John Brown & Co., of Glasgow. Her valuation was never made public by the builders or owners, but insurance estimates reckoned it at about \$9,000,000.

The Lusitania was indirectly responsible for the creation of the leviathans Vaterland and Imperator, built by Germany in an effort to wrest New York traffic from the British ship owners. Until the advent of the Lusitania the Hamburg-American liner Deutschland held the transatlantic speed record, from Southampton to New York, of 5 days 11 hours and 54 minutes, made in 1903. Then came the Lusitania in 1907, her powerful turbines tuned to perfection by her British builders, and the Deutschland's record fell. The Cunarder's time was 4 days 11 hours and 42 minutes.

Hamburg-American line officials sought to challenge the genuineness of the new record, but it was only necessary for the world to wait until the Lusitania again clipped minutes off her own record to substantiate the British speed superiority. Some time later the Mauretania, a sister Cunarder, was built, and proved equally superior to German speed. This goaded the Germans into spirited competitive building, and the Vaterland and Imperator, both of greater tonnage than the British ships, were built and sent out to compete for American business.

Lost to Germany

To-day the Lusitania lies a deplorable wreck eight miles southwest of the Old Head of Kinsale. The Imperator flies the British flag, an ironical quip of war and fate. The Vaterland, now renamed Leviathan, lies at a United States Army Transport Service pier at Hoboken, the property of the United States, a government white elephant for which a recent call for bids brought one offer of a third of her building value—if the government would lend the bidders the money.

The floating of the Lusitania—if she ever is floated—will settle once and for all the war controversy which immediately followed her destruction. Persons in New York, supposed to have been in the pay of Germany, swore that when the liner left New York on May 1, 1915, she carried masked six-inch guns in violation of the international laws of war. One affidavit related that two of these guns were mounted on a stern deck and two more were mounted forward. The German Embassy in Washington submitted this "proof" to the White House in contradiction to an official denial that such was the case by Dudley Field Malone, then Collector of the Port of New York. Count Bernstorff, the German Ambassador, attempted to justify the sinking of the liner by terming her a "British auxiliary cruiser," and he likewise maintained that she carried arms and ammunition.

Birds That Flock Together in Millinery Stores

AMONG the birds whose feathers flock together in the millinery stores, where they wait for the ladies to come in and select them for their hats, none is more plentiful or well known than the ostrich. However, few who stop to admire the beautiful plumes give much thought to the large, powerful birds which furnish them.

The ostrich once roamed abundantly on the dry, sandy plains of Asia and Africa, but at this time about the only wild ones are found in southern and eastern Africa, where are also to be seen the largest ostrich farms in the world. Almost all of the plumes you see in the stores to-day come from tame ostriches raised on farms where hundreds, and even thousands, of them are herded together. Some of these farms in the United States are located at Jacksonville, Fla.; Hot Springs, Ark.; several in California and Oregon, and one large farm in the Salt River Valley, near Phoenix, Ariz., now has more than 3,000 of these big birds.

The male ostrich frequently reaches a height of eight feet and an extreme weight of 300 pounds. He is a swift runner and can easily outrun a horse when going at full speed. It is claimed that they have gone as fast as thirty miles an

hour. Although the ostrich cannot fly, it uses the motion of its wings to help pull its body through the air as it runs, and this enables it to make the phenomenal speed claimed for it. It is getting to be quite a fad for these big birds to be ridden at fairs and other places where novelty and speed combine to make it a general favorite with the spectators. The mother birds usually pool their eggs when they are not in the captive state and are free to roam wherever they wish. That is, three or four of them place their eggs in one common nest, scooped out in the warm sand, and take turns at setting during the day. At night the male looks after the eggs while the mother birds group about him to give the alarm if danger approaches. Each of the eggs is larger than two dozen hen eggs and weighs about three pounds. The heat of the sand helps to hatch these giant eggs in about six weeks, the little ostriches being the size of a full grown hen. Some naturalists have claimed that the female birds break up the eggs that do not hatch so as to attract swarms of insects as food, for their young, while others scout the theory and say that the regular diet of grass, leaves, grain and seeds is first given to the newly hatched.

Commercially, farmers raise these

big birds for the sake of their feathers, those of the wing and tail being most desirable for trimming hats or other purposes. The plucking season begins when the birds are about eight months old, and a full grown one is expected to yield one and a half pounds of feathers. The body feathers of the male are black, while the tail feathers are usually white or ivory-colored, and the wings white, with occasional streaks of glossy black. The body feathers of the female are dark gray, the wing and tail feathers being white, with sometimes a marking of gray. The large willow plumes displayed in the stores are not taken from the ostrich as they are, but are made by hand, which is one of the contributing causes to the high price they bring. Ostrich feathers are not very large, so in order to make them larger flowing plumes the small ones are cut up and sewed together. This is a very tedious process and requires exceptional skill in assembling so that the finished willow plume will be symmetrical.

Probably you will be surprised to learn that some birds of paradise are no larger than sparrows, but, of course, their beautiful tails are long and flowing, and make them appear to be much larger birds. There are several varieties of this bird, the

most prominent of which is the king bird of paradise, which get their name from the fact that they flock in droves of forty or more, over which the leader or king has full control. The king bird of paradise is as beautiful as it is rare. The upper parts of the body are chestnut, with just a trace of purple, while the under portions are white. A band of light golden green is drawn across the chest, and about the middle of the back begin the long feathers, which are so much prized. Any lady who has a bird of paradise has solved her hat decoration problem for years, as they can be used from season to season on different hat shapes. The bird is a native of New Guinea, but it is getting scarcer each year, as the taking of the feathers means the death of the bird. Ruthless slaughter of them by the native hunters has been stopped to some extent by laws which are intended to prevent these beautiful birds from becoming extinct.

The egret is found in many parts of America, though its principal home is in the southern sections, from which it visits the northern parts about the first of March to spend the summer season. Its favorite haunts are marshy regions, where it feeds on fish, frogs and various other kinds of small creatures. The

egret is a large and handsome bird, sometimes being four feet in length. The beautiful loose feathers of its train are not fully developed till the third year, when their pure white and sometimes creamy-yellow tinge is so much desired by dealers. The feathers of the train are so long and flowing that they frequently cover the tail and almost reach the ground. The long, sharp bill of the egret measures about six inches and is a rich golden brown in color, darkening into black at the tip. Its long legs are black and the eye is pale orange, which gives it much harmony of color. Of late years hunting of the egret has been forbidden in most sections of the country and its beautiful plumage is not now so easy to get.

Scarcity of other material has caused the plumage of the pheasant to become popular. Originally the pheasant was a native of Asia Minor, but now it has been domesticated and is found in almost every country of the world, just as is the chicken. The male pheasant is truly a beautiful bird, with its neck and head of deep steel blue, shaded with greenish purple and brown, and the upper part of the back covered with light golden red feathers, tipped with deep black. The remainder of the back is of the same golden red, but is marked with

brown and a lighter tint of yellow. The wings are of several shades of brown. The total length of the ordinary pheasant is about three feet, but a variety known as Reeves' pheasant has tail feathers which give it a total length of eight feet. This large bird is the most beautiful of the pheasants, and its original home was northern China. Amherst's pheasant is a native of the same section of China and has a long, beautifully colored tail that almost rivals that of the Reeves'. However, unlike Reeves', it has a magnificent crest of scarlet, while the tippet is snowy white, each feather being tipped with velvety black. The collar-like effect produced by this tippet is very odd and attractive. Several other varieties of pheasants are often called upon to supply the scarcity of real fine plumaged birds.

Modern methods and processes have enabled feather dealers and dyers to use almost any kind of feather for hat decoration, and in these days of high cost of living many chicken or turkey feathers are to be found on cheaper grades of millinery. But the dyers disguise them with beautiful color combinations, and trimmers then arrange them in such attractive styles that it doesn't matter very much after all.