

TORPEDO BECOMING MORE FORMIDABLE

Latest Type Carries Gun Designed to Fire Shell Under Water.

HITS SHIP BELOW ARMOR

It's Like a Gun and Fires When It Hits an Obstruction.

There was a time in the history of naval warfare when under water attack was frowned upon as not being quite in accordance with the ethics of the day. The contrary is true now. The torpedo and the submarine mine are very much in evidence in every scheme of marine attack and defense today. With the battleship guarding its vitals more and more behind walls of highly resisting steel, and with the naval rifle gaining in range and destructive energy, naturally the inventor turned to devising instruments or weapons of submarine assault which would reach the battleship where it was weakest.

It was only a few years ago that the automobile torpedo had an effective range of a trifle more than a thousand yards, and even at that distance its accuracy of travel was an uncertain quantity. Sometimes it went straight to its target, at other times it went far off to either side and once in a while it described a wide loop and came rushing back upon the vessel that launched it.

Admittedly destructive as its warhead charge of gun cotton was still these erratic performances caused grave misgivings. Under the circumstances you can appreciate the scepticism of the advocate of the gun; and naval men generally believed that with quick firing weapons they could easily keep the torpedo craft at arm's length, hold them far enough off so that the torpedo, even if it ran true, could not reach its mark.

But the torpedo enthusiast was full of faith in his chosen weapon, he realized his possibilities even though they were but imperfectly developed, and he set about his task of improvement undaunted. The principal weakness was the steering apparatus which guided the torpedo after it had left the launching tube. In the last two or three years a good deal has been heard about gyroscopes—technical developments of the tops of our childhood. A type of gyroscope is now available which is strong enough in its corrective powers to control the travel of a torpedo for several miles.

This change made the partisan of the gun sit up and take serious notice. But the capacity of the gyroscope outlasted or exceeded the running endurance of the torpedo's reserve of propulsive air. There was an obstacle that dashed cold water upon the hopes of the torpedo man, but the chilling reaction in the shape of a brilliant inspiration.

Up to a point the metallurgist made it possible to fashion a tank capable of holding air at a higher pressure; in other words more air to kindly the engines. But this did not add more than five or eight hundred yards to the effective range of the torpedo. This was no answer to the reach and accuracy of the rapid fire gun.

You know that air when heated expands, but compressed air when heated is pretty nearly a dangerous double of powder and a lighted match. Just the same, an American torpedo engineer devised a way to apply flame to the compressed air in the torpedo's tank, and he did this so cunningly that the rise of pressure above a certain point automatically checked the fuel for the flame and effectively prevented the tension nearing its bursting point. By expanding the air in this manner a motive energy for far greater distances was generated, and this was done without increasing the size of the tank or the maximum practicable pressure of the confined air. It amounted substantially to giving the torpedo its second wind.

Compact and wonderful as the little reciprocating engine was that so long drove the automobile torpedo, it was only natural that the turbine should supplant it, and this is the motor now used in the latest of these weapons. The torpedo has grown from the 18 inch type of shorter length to the long 18 inch and 21 inch patterns of the present.

Likewise the charge of gun cotton carried in the wicked heads of torpedoes has increased, reaching to-day in the biggest torpedoes a weight of more than 200 pounds. Battle ranges have gone from 4,000 to 6,000 yards and an effective range of quite 8,000 yards has been promised.

All of these improvements have come to pass within the last few years and the torpedo has not only obliged the installing of bigger guns on battleships to stand off attack, but it has forced upon the naval constructor hull changes of a vital character below the waterline. The partisan of the gun no longer smiles indulgently upon his fellow torpedo officer because he knows that he is face to face with a menace of no mean proportions.

A modern automobile torpedo costs anywhere from \$7,500 to \$7,000, and this means that practice is carried out with such care and the recovery of sunken torpedoes attempted at some risk in the nature of economy.

But the torpedo and the defence against it are fighting the same battle that armor and shell have waged for years. The naval constructor has found ways of strengthening the underbody of big ships so that the explosive gases of the torpedo's gun cotton shall be sapped of their first violence by having guarded them of sufficient volume in which to expand. In this way the probable area of damage is restricted, the likelihood of a torpedo's sinking a ship through a single breach reduced and the chance of retaining the very vitals of a craft made practically impossible.

Notwithstanding the growth of the weapon the advantage now lies largely in the side of the defence. Once more the torpedo man was apparently stumped. Such was the state of affairs until within a very short while ago, in fact until within the last few months when demonstrations led another story.

The explosive energy which can be set out of a given weight of gun cotton does not increase directly with each added pound of the explosive. Apart from this some forms of protective nets have been designed which are quite effective and these hold or arrest the further advance

of the torpedo at a distance of say thirty feet or so from the sides of the ship assaulted. Commander Cleland Davis, U. S. N., has struck out upon new lines that promise to widen greatly the offensive powers of the automobile torpedo.

For a warhead filled with gun cotton he substitutes a gun capable of firing a shell loaded with a high explosive. The gun is made of vanadium steel and is remarkably light for its strength. When the torpedo's nose hits an obstruction, whether protective net or the ship's bottom, the gun is fired and the shell discharged with velocity enough to cut its way through the net, travel the intervening water and bore its way through the inner and outer skins of a craft and still have momentum enough left to carry it through several inches of thin armor, bursting finally in some vital region of the vessel.

The ordinary torpedo explodes upon the instant of hitting the outer plating of a ship and a goodly measure of the gun-cotton's energy is expended in blowing skyward many tons of water; all of its power to harm is not concentrated upon blowing in the opposing steel and making the shortest cut to the very life centres of the craft attacked. The gun torpedo, on the other hand, goes at its deadly work with almost sinister singleness of purpose. When it has penetrated far enough then the projectile bursts with all of its stored up violence.

Just fancy what this would mean if the shell reached a magazine, a shell room or one of the boiler compartments. Not only would loss of life and grave injury be certain but the whole ship might be destroyed and sent to the bottom in a few moments. This weapon is not yet aboard any of our ships, but it will probably be part of the ordnance equipment of some of the fleet before long.

It is not the torpedo which accomplished most in the way of underwater damage during the war between Russia and Japan. The ships that were sunk quickest and with heaviest loss were those that were sent to the bottom by means of submarine mines.

The submarine mine generally carries a very large charge of gun cotton, and in this particular is more certainly destructive than the automobile torpedo. Of course it has the disadvantage of being a passive menace; it must be run into by the enemy if its explosion is effected by contact. However, the Japanese showed how these limitations could be set at naught. One instance is worth recalling because it gives us an idea of just what our mine planter, the U. S. S. San Francisco, may be expected to do should the hostile occasion arise.

On April 13, 1904, when steaming confidently back towards Port Arthur, with the enemy disappearing and scarcely more than a smoky blur upon the distant horizon, Admiral Makaroff's flagship hit two Japanese mines and in less time than it takes to tell she was shattered, sinking like a stone. The night before a Japanese flotilla of torpedo craft had crept up close enough to Port Arthur to plant a line of contact mines across the channel usually employed by the Russians in passing in and out of the harbor. Some of the torpedo boats had even made a feigned attack from another point so as to draw attention away from their fellows engaged in the more sinister work.

When daylight dawned nothing was seen of these boats, but in the distance was discovered an approaching squadron of armored ships. These were only a few which Admiral Togo had sent ahead to draw the Russians out of the harbor. Admiral Makaroff, gallant old sailor that he was, went forth with seven of his ships to try conclusions with his foe, but the way Togo had planned differently. The Japanese decoy squadron kept just out of harm's reach and headed seaward until the Russian Admiral discovered the enemy's main force coming up over the horizon.

Then it was that Admiral Makaroff thought he saw through Togo's strategy and accordingly swung his ships around and headed homeward from the superior fleet, but he was walking right into the trap which had been cunningly set. Two of the Japanese mines hit the Petropavlovsk and their explosion detonated the ship's big magazines! The Petropavlovsk went to the bottom, but the Pobieda, which hit another mine a few minutes later, although grievously wounded, was able to crawl back to harbor and under the protection of the guns of Port Arthur.

Later that same season the Japanese battleship Hatsuse stumbled upon a pair of Russian mines, which likewise detonated her magazines, and she and nearly all of her crew went down in deep water.

SIR HERBERT TREE AND THE POST OFFICE GIRL



SIR HERBERT BEERBOHM TREE.

THERE is no man in all England to whom so many witty stories are accredited as Sir Herbert Beerbohm Tree, who sailed away back to the land of his knighthood last Wednesday after a brief visit to this country, the first in sixteen years. A remarkable thing about these stories is that they are all true. He really says the clever and epigrammatic things with which he is accredited.

While here he had but one opportunity to display in public his talent for humor and epigram. That was in the course of a short address he gave at a theatre before a club. Those who were fortunate enough to be present and those who read the reports of the speech in the newspapers know that his English reputation is justified. Story telling, however, is not really his forte. His sharp tongue is more effective in reports.

When the late King Edward was Prince of Wales he said: "I suppose, Tree, you have what is known as the artistic temperament." "Ah, the artistic temperament," replied the actor. "I wonder, is it a gift of God or a visitation of Providence?" While here he told the interviewers that he considered Americans to be the greatest of theatregoers. Then in private he said: "But I mean in quantity, not quality."

Sir Herbert does not look in the least like a humorist. He is a little more than six feet tall and was formerly very slight. To-day he is of fuller proportions, to put it mildly. He is

clean shaven, with fair hair and eyes that in his genial moments are an intense blue and in his thoughtful moods gray green, like mistletoe. He is most commonly accepted and caricatured as an absent minded dreamer and a creature of cloudy abstractions.

Of his absent mindedness many good stories are told. One day he took a cab and gave the driver the address. Throughout the journey he was reading letters and when the house was reached he alighted, still reading, and knocked at the door. When the door was opened Sir Herbert looked up abstractedly and said to the amazed servant: "Come in! Come in!" Still reading, he reentered the cab and returned to the theatre before he discovered he had not made the call he set out to make.

All through his life he has been pretty severely harried by criticism of his style of acting. One day in a caustic burst he said: "I shall soon be able to retire on the blackmail I have not paid."

One day he walked leisurely into the West Strand post office, which is a particularly busy place. The young women clerks there have no time for frivolity. What between selling stamps, answering the telephone, weighing parcels and counting the words in telegrams their minds are completely occupied and their faces wear a worried look that won't come off.

Sir Herbert strolled up to the counter and leaning over said in his suavest tones: "Do you sell stamps here?" "What kind?" snapped the girl, who didn't recognize him.

"I should like to see some penny stamps."

"How many?" "I should like to see some, please." The girl gave him a contemptuous glance, opened the blank book in which they keep the sheets of stamps in England, and shoved it in front of him. Sir Herbert adjusted his monocle and studied the sheet carefully for a full minute. Then very deliberately he placed his gloved finger on the stamp exactly in the middle of the sheet and with his peculiar lip and most innocent expression said: "I'll take that one, please."

The girl snatched the sheet back, tore one off the corner and passed it to him. Sir Herbert picked it up as though it was of priceless value. "How much, please?" "Fenny."

"Really! Only a penny! That is very reasonable. I shall tell all my friends to come here to buy their stamps."

Even the worried post office girl couldn't withstand such sublime idiosyncrasy and smiled. Immediately she did so Sir Herbert dropped the stamp and laughingly handed her a sovereign.

"That's yours," said he. "I made a bet with myself that try as hard as I could I would not be able to make a post office girl smile, and you win."

His elaborate and costly productions at His Majesty's Theatre are well known even on this side of the Atlantic. Once on being remonstrated with for such prodigality he said:

"Thrift is a virtue it is easy to urge upon others."

Stepping into an English railway carriage, he found himself alone with a

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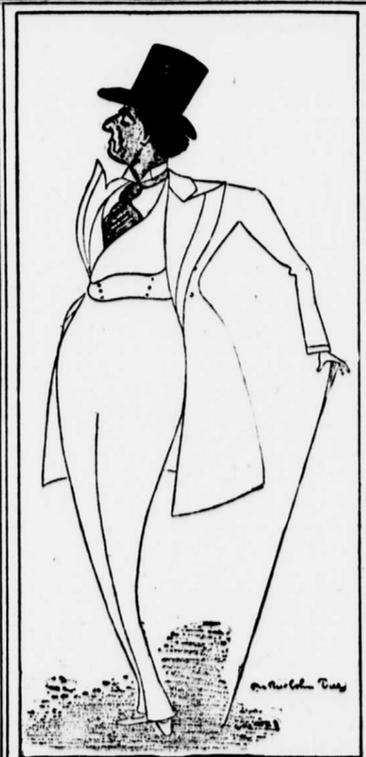
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Mr. Tree as Egin in Oliver Twist.



Caricature of Mr. Tree by Max Beerbohm, 1896



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