to the bottom of the harbour to prevent entanglement with floating objects; their electrical condition tested, as to continuity and resistance, both before and after planting, and all other conditions, with one exception completely fulfilled, to render them a controllable source of hidden mischief for a day a week, or a year. The one exception consisted in the torpedoes being suspended from buoys, at the surface, whereas in actual warfare an air chamber in each torpedo would have given them the requisite buoyancy, and at the same time hidden them from view. The buoys were however, in this case necessary to afford an accurate idea of the space through which to tow the unwieldly craft, as well as to facilitate the view of spectators from any point in the harbor.

The theory of the experiment consisted in so disposing a given amount of explosive substance, as to transmit its destructive effect to a greater surface of overlying water, than could possibly be effected were the entire amount of explosive confined in a single case. Most people are aware that, in torpedo work, the radius of destructive effect of any single torpedo is remarkably small, so small, indeed, that practically the object to be destroyed must be directly over it. Suppose that four single torpedoes be so placed, with regard to each other, then, at such point of impingement, there would probably be a combined upward effect due to any two adjacent torpedoes; while, in centre of the square; described by the position of the four, there should be a still greater upward effect, due to the combined effort of all four; this combined effect being independent of what each would produce by itself on any object in its immediate vicinity, and far beyond the limits of effect of any large torpedo in the position occupied by the centre of the square. In the case before us, as previously stated, the sides of the square were 40 feet in length, affording a surface of 1,600 square feet, supposed to be absolutely protected, to say nothing of the possible damage to be received in approaching too nearly to the corners of the square even on the outside. The position of the group was shown by a "Siemen's Position Indicator," an electrical apparatus by means of which an operator at one extremity of a base line is kept continually informed of the bearing of any object as seen from the other extremity. This information is conveyed by a pointer, on a chart in front of the operator, which moves in unison with a telescope at the other extremity of the base, the motion of the pointer being given by a magneto-electric apparatus, in the hands of the observer with the telescope.

. . . As the hulk was seen approaching the locality of the four buoys, she appeared to be moving in a direct line for the centre of the group, unfortunately, however, her unwieldiness caused her to deviate considerably from this line, and the four torpedoes were exploded simultaneously. The shock of the discharge was very heavy and sharp. The hulk was raised bodily from 12 to 18 inches from the surface, amidst a tremendous body of water, which, unlike the regular dome shaped column of the powder torpedo, appeared to be torn into a million fragments cut bodily from the smooth surface of the harbor.

The uprush appeared to throw the hulk violently over to starboard while in mid air, and the subsiding of the waters showed her to have a permanent list in that direction, which was soon shown to be caused by the water rushing through a hole in the starboard bow. caused by torpedo No. 2, the nearest one to her at the time of the explosion. Immediately after the experiment, the hulk was found to be making water so fast that she was towed to the side of the break water, at the north end of the island, where she shortly sank. An inspection of her injuries, while alongside the breakwater, showed her to be shattered badly on the stem and stern post, and to be *hogged* six inches amidships. The injuries on the starboard bow could not be examined, as they were well under her bottom, and the water was entering rapidly. Around the stem, the hand could be inserted where the butt ends of the planks had formerly fitted into the rabbet, from a height of six feet above the water's edge to as far below as one could see. The stern post presented nearly a similar appearance, and the butts of the deck planks were separated full two inches from the covering board. The vessel was leaking fore and aft; but the most remarkable result of the explosion, as confirmatory of the theory of the group, was the *hogging* of the vessel.

Nos. 2 and 3 individually shattered the bow and stern, No. 2 being very nearly, though neither was directly under her. Nos. 1 and 4 undoubtedly had little to do, but had the vessel being passing, as it was intended she should do, there seems scarcely a doubt but that she would have broken completely in two. As it was, her extreme lightness was her only salvation from *instant* destruction. The effect of the experiment was peculiar. As few of the spectaters had ever seen a torpedo exploded beneath a vessel, and as she was not instantly disintegrated, with her masts sent flying into the air like so many rockets, some little disappointment was felt, and as several bystanders remarked, "it was not much for show after all." Had the whole of the nitroglycerine been in one case, and hung only 3 feet beneath a buoy on the surface, its effect would undoubtedly have equalled the expectations of the most sanguine, had the hulk been brought over it; but however beautiful the spectacle, 'twould not have been "war" after all, and as the Newport daily very justly remarked of the vessel "Like Mercutio's," her wound sufficed.

Following this experiment, came the ignition of a torpedo near Rose Island, through a mile of cable laid from the Torpedo Station to that point. This explosion, unlike those which preceded it, was effected by a battery of cells, and the sudden rising of a huge column of water at such a great distance at the instant the word of command was given, impressed one very forcibly with the almost unlimited distance at which these submarine engines can be operated. The next experiment was to show the ability of a large Farmer's machine to fire a great number of torpedoes at once, should occassion require. For this experiment a large machine, in regular use at the station for the production of an electric light, was properly adjusted, and 640 fuses were connected in 8 circuits of 80 each. On passing the current all but a few exploded, and these, as was expected, were found to be irregular in resistance and defective. The capacity of this machine is rated at about 2,000 fuzes. After this exhibition, the exercises of the day were concluded by the successful detonation of the dynamite, which has been already described, and after witnessing the effect of this powerful explosive, the committee repaired on broad the *Despatch*, apparently well pleased with the day's exhibition.

On the following day the experiments were continued on board the *Intrepid*; the committee, however, accompanying the *Intrepid* in the *Despatch*. The experiments consisted in the destruction of the schooner *Uncas*, a weather beaten craft of about 40 tons. As the *Despatch* was to leave for Boston at noon, an early start was made, the *Intrepid* getting underway, with the hulk in tow, at 8.30, and the *Despatch* at 9.30 A. M. Arriving near the light ship, outside the harbor, the hulk was dropped, and the *Intrepid* prepared to run for her with a Harvey Towing Torpedo. The torpedo exploder was a simple electric fuze intended to be fired at will, the fuze wire connecting the torpedo with the ship as well as the towline, but taking none of the strain. The torpedo being launched, and a sufficient scope of cable being reeled out, the *Intrepid* approached the hulk from such a direction as to pass under her stern, running so close that the towline on the torpedo proved long enough to hide it behind the bow of the schooner, so that the proper instant for igniting the charge could not be taken advantage of, and it was exploded a little prematurely, doing but slight damage to the vessel. The *Intrepid* then rigged out her port spar torpedo, and bearing down on a line parallel with the hulk, succeeded in placing her torpedo well underneath her midships, and exploded it with terrible effect. The hulk was completely destroyed only a portion of her stern appearing above the surface of the water. This portion of the wreck was subsequently destroyed by the starboard spar torpedo, leaving scarcely a chip on the surface to mark the spot where the vessel was demolished. This ended the morning's experiments, and both vessels immediately returned to their anchorage, the *Despatch* leaving again in an hour with the committee for Boston.

EYE WITNESS.

A despatch from Madrid Sept. 4th, reported that two thousand men would be sent to Cuba in a few days to reinforce the Spanish troops on that island. It was also reported that Carlists had abandoned the siege of Puigcerdo. The failure of the insurgents to capture the place caused great rejoicing in Madrid. The Carlists are intrenching themselves around Bilbao. A special dispatch to the London *Times*, from Madrid, says that either Gen. Moriones will be appointed Commander in Chief of the army, or Marshal Serrano will be styled Generalissimo, with power to appoint the generals. The German men of war *Nautilus* and *Albatross* returned to Santander Sept. 5, from San Sebastian. The Carlists fired on them from Guetaria, ten miles west of San Sebastian. The Germans replied by throwing 24 shells into the town. Gen Primo de Rivera has been appointed Captain General of Madrid.

The project to construct a tunnel between France and England is assuming a practical phase. The capitalists and engineers embarked in this gigantic enterprise demand a concession of thirty years instead of the ninety-nine usually accorded to railway companies, and ask for neither guarantee nor grant. Further, they are ready to advance a sum of four millions for preliminary investigations. The project in quastion consists in the immerging of a duct on the English and French coasts, and the boring of two long galleries from each side. Of the result of the enterprise, say the *Journal de Caldis*, there can be no doubt.