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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 129,

For the Week ending June 22, 1878.

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THE PROBLEM OF UNSINKABLE SHIPS.

A collision in the British Channel between two large German ironclads, the Grosser Kurfürst and the König Wilhelm, recently resulted in the sinking of the former vessel and the drowning of nearly 300 of her crew. The Kurfürst, which was leading the squadron, two other ships following close in rear, changed her course to avoid a crossing merchant ship. The König Wilhelm attempted to do likewise, but it is alleged that she refused to mind her helm, and thus came into collision with the Kurfürst, ramming that ship about amidships, and causing her to sink almost instantly. The weather was fine and sea smooth, so that the evil done was restricted wholly to the effects of the blow.

This disaster calls for something more than passing comment, not merely because it adds another item to the already long list of similar casualties among modern European ironclads, but for the additional reason that here was a splendid vessel, fitted with the most improved appliances to prevent or retard the very fate which she encountered, but which proved manifestly unavailing. She had a double skin, divided into watertight compartments, which were even carried to the extreme ends of the vessel to prevent possible injury to these usually unguarded portions. Besides these fore and aft compartments the entire ship below the battery deck was transversely divided into twelve sections, provided with watertight doors. The appliances for freeing her of water were apparently ample for any emergency. A 12½ inch pipe was laid through the main compartments, and provided with branches communicating throughout the ship, and also with the powerful pumps connected to the engines. Supplementary to these pumps were four other pumps on the battery deck, calculated to be used in case of any failure of the main engine, and considered alone fully capable of dealing with any ordinarily severe leak. The ship was 298¼ feet in length, 52 feet beam, 23 feet deep, and measured 6,558 tons. Her engines, under test, had driven her at a speed of 14 knots, developing 5,327 horse power. She had one turret with 10·32 inches of armor, and was a comparatively new vessel, having been launched in 1875.

When a ship apparently has her whole interior divided into cells, between which water communication can be cut off at will, and besides possesses enormously powerful engines and pumps, it might be supposed that she was proof against any accident which might result in destroying two or three compartments; that is, that she would at least float long enough to be brought into the nearest port, the weather being fair. This might be predicated of a merchant vessel not primarily designed to meet the possibly severe injury which a man of war must encounter in action, while the latter as a first requisite, it would seem, must possess the capability of remaining on the surface and fighting her guns until literally overwhelmed. It is a significant commentary, however, that after all the immense sums spent abroad on war vessels, all especially designed to ram and to withstand that mode of attack, the only times that they have been subjected to actual crucial test of their resistance they have sunk almost instantly. The Vanguard after the Iron Duke's blow floated long enough for her crew to be removed, and she is still on the bottom; the Kurfürst heeled over and went down inside of five minutes. It has been proved that the famous Inflexible, should her unprotected ends be knocked away in action, would turn over and sink despite her compartments, and when merchantmen are considered the almost certain destruction of every one that grounds (the Idaho of the Williams & Guion line just lost on the Irish coast is the latest example)—all goes to show the fact that we have very much to discover before the problem of building unsinkable ships can be solved.

The subject is one to which inventors may profitably devote patient study, and whether the present compartment system can be supplanted by a better one is a question for them to decide. There is no doubt that, had the Vanguard's compartments been closed, the uninjured ones would have floated her; the same is probably as true of the German ironclad. But both instances demonstrate beyond any doubt that, when a large hole is suddenly made in a vessel's side, there is no time to shut doors and isolate the compartments before the ship is past recovery. This suggests the idea of arranging sliding compartment doors in connection with machinery, which by a turn of a wheel will close all instantly.

This is simply a matter of mechanical detail. The recent casualty also suggests the possible necessity of new steering arrangements for such immensely heavy vessels—which oppose their excessive momentum to any change of position of the rudder, and hence steer slowly. The disaster also lends additional force to the arguments we have already advanced as indicating the many shortcomings of the modern ironclad, and the likelihood of its playing no important part in future wars.

THE PHONOGRAPH WINS A VICTORY.

The phonograph has been distinguishing itself lately in this city by its remarkably accurate reproductions of the cornet solos of Mr. Levy, the famous performer on that instrument. Mr. Levy possesses the phenomenal ability of getting notes out of the cornet which, he says, "are not there," or in other words, he plays airs in notes an octave lower than any one else has succeeded in producing on the cornet, and thus he has extended the range of his instrument over four full octaves. The phonograph, however, not only follows Levy, but surpasses him, by reproducing cornet notes in entirely new octaves of its own origination, proving itself to have a compass of extraordinary range, if not especial tunefulness and brilliancy.

At a very pleasant reception given to Mr. Edison recently, in this city, a most interesting conflict between Levy and the phonograph occurred. Messrs. Edison and Johnson ably seconded the phonograph, and of course none but Levy could scientifically manipulate the cornet. Fresh tin foil being adjusted on the cylinder, the bell of the cornet was placed near the mouth piece, and Yankee Doodle, first plain, and then garnished with variations of the most decorative character, assumed the form of dots on the foil. Without the loss of a note, the phonograph repeated it, and not only this, but even the peculiar expression imparted by the player, and the triumphant kind of a flourish which brought the tune to a conclusion, were reproduced with wonderful accuracy. After several other popular airs had been similarly replayed, Mr. Edison showed the effect of turning the cylinder at different degrees of speed, and then the phonograph proceeded utterly to rout Levy by playing his tunes in pitches and octaves of astonishing variety. It was interesting to observe the total indifference of the phonograph to the pitch of the note it began upon with regard to the pitch of the note with which it was to end. Gravely singing the tune correctly for half a dozen notes, it would suddenly soar into regions too painfully high for the cornet even by any chance to follow it. Then it delivered the variations on Yankee Doodle with a celerity that no human fingering of the cornet could rival, interspersing new notes, which it seemed probable were neither on the cornet nor on any other instrument—fortunately. Finally the phonograph recited "Bingen on the Rhine" after its inventor, then repeated the poem with a whistling accompaniment, then in conjunction with two songs and a speech, all this on one tin foil, though by this time the remarks began to get mixed. Just here Levy returned to the charge, and played his cornet fiercely upon the much indented strip. But the phonograph was equal to any attempts to take unfair advantage of it, and it repeated its songs, and whistles, and speeches, with the cornet music heard so clearly over all, that its victory was unanimously conceded, and amid hilarious crowing from the triumphant cylinder the cornet was ignominiously shut up in its box.

The occasion of Mr. Edison's reception was the exhibition of a fine organ made by Mr. Hilborne L. Roosevelt, of this city, for the Episcopal church in Rome, Italy. Some one, a reckless partisan of the phonograph, who was affected with enthusiasm over the victory of the instrument, and also by the fumes of the carbonic acid from a vinous beverage of French extraction, suggested that the phonograph be pitted against the grand organ. It was with difficulty that Mr. Edison, who, during the evening, had repeatedly manifested a desire to do this, could be persuaded into confining himself to the simple assertion that it would be successfully done some time, and the phonograph was thus saved the strain of a second struggle, with a more formidable competitor.

REAPERS AND MOWERS AT THE PARIS EXPOSITION.

We publish elsewhere in this issue an admirable letter from Mr. Edward H. Knight, our correspondent at the Paris Exposition, in which a careful comparative study of the various reapers and mowing machines there exhibited is made. Mr. Knight's analysis of the essential portions of the French machines, and his showing of how they are all, in very large part, of American origination, is exceedingly instructive and valuable, not merely as indicating how quick foreign manufacturers are to adopt American devices, but as proving how necessary these contrivances have become in an entire great class of labor-saving machinery the world over. The account of the cool piracies by Canadian and Swedish manufacturers of Adriance and Platt machines will prove as amusing to our readers, we imagine, as it will distasteful to the parties implicated when they learn of the exposure.

It is scarcely necessary for us to add that Mr. Knight is especially well qualified for the presentation of a discussion and report of this kind. He is a mechanical engineer of superior ability, author of the "Mechanical Dictionary" which bears his name, an old attaché of the Patent Office, and generally one of the best informed men on mechanical subjects now living.

Opening of the Metropolitan Elevated Railroad.

Trains on the Metropolitan Elevated Railroad (formerly the Gilbert) began trips on June 5th. Immense numbers of people crowded the cars, until even the platforms were full. The time between Trinity Church and Central Park averaged about twenty-seven minutes, including stoppages, and there was but one accident—a locomotive leaving the track and running into a couple of cars, through some error in placing a switch. Until the stations are completed and gas introduced no trips are to be made after dark. During the day it is intended that they shall take place every five minutes.

It seems likely that the road will be more of an annoyance to dwellers along Sixth avenue than has been supposed, owing to the noise of passing trains being greatly intensified by the resonance of the large iron supporting structure. In the tunnel under the latter the sound of a train passing overhead is deafening, and the street car horses have repeatedly taken fright and run away. Whether the equine population of the city will become accustomed to this is questionable; and for the present at least prudent drivers of private vehicles will avoid streets through which the line passes.