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NEW YORK, SATURDAY, MAY 20, 1905.

The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

THE RECENT RAILROAD HORROR.

The shocking railroad disaster near Harrisburg on the Pennsylvania Railroad lines is strangely like the still more fatal accident that occurred on the allied lines of the same system, when over half a hundred lives were lost. In each case the wreck of the passenger train was caused by a freight train on the adjoining tracks. In the accident of over a year ago the loss of life was due to careless loading of timber on a flat car, the material being insufficiently secured against lateral displacement due to the jolting and lurching effects in passing around the curves. Some timbers were displaced and struck the cars of the passenger train, precipitating the disaster. In the present case, the wreck was caused by the buckling or crumpling up of a long freight train, to which the brakes were being suddenly applied to prevent a collision between the freight train and a switching engine. The buckling of the train threw the cars against the express, wrecking the train and causing the detonation of some high explosives that were on the derailed freight cars. Much of the horror of the accident, which involved the death of over twenty people, and the injury of probably a hundred others, was heightened by the frightful explosions and the subsequent burning of the wreckage which contained many of the imprisoned passengers. The marvel of the wreck is not that so many, but so few, were killed.

We wish to draw attention to the fact that this catastrophe shows, in a most dramatic way, what a great peril the passenger trains on four-track railroads are exposed to in having to sweep past the whole length of the many 40- and 50-car freight trains, which they meet so frequently in traveling through busy manufacturing districts such as those traversed by the Pennsylvania Railroad. It is a fact well understood by railroad men that the enormous length to which freight trains have grown of late years exposes them to exactly the kind of accident which caused the recent disaster, namely, the crumpling up of the train when the brakes are suddenly applied if the action of the brakes is not uniform throughout the whole length of the train. If a freight train of 40 or 50 cars and weighing over 2,000 tons is traveling say at 20 miles an hour, and the air brakes are applied and act simultaneously and with equal efficiency on every car, the whole train would be brought to rest without any danger of crushing or displacing the cars. But if the action of the brakes should be faulty, and the brakes should be set hard on say only the first half or third of the train, the enormous momentum of the last half or two-thirds, expending itself on the portion upon which the brakes are in full action, brings a crushing strain which the cars are unable to withstand, and they are forced into one another or twisted from the track and thrown sidewise onto the adjoining tracks. It is well known among railroad men that accidents of this kind are extremely frequent, and that they constitute a standing menace to fast trains on the adjoining passenger tracks—a menace that cannot be safeguarded by signals, not, at least, if the wreck should take place when the express is within a short distance of or passing the freight train. This is one of the perils to which the recent rapid growth of freight traffic, and the endeavor to cheapen its transportation by using enormous engines and trains of exaggerated length, have brought us. The only safeguard against it is the exercise of eternal vigilance on the part of the engineers of passenger trains, and the most careful use of the air brakes on the part of the engineers of long and heavy freight trains.

TWO GREAT OCEAN CONTESTS.

The eyes of the world just now are fixed with fascinated interest upon two great contests on the high seas, the like of which the world surely has never witnessed before. In each case the prize is a big one, and its possession means so much to the contestants, that every nerve will be strained to the utmost for its coveted possession. It is in this element of keen rivalry alone, however, that the two great struggles have anything in common. Outside of that they are as far asunder as love and hate, exhilarating life and bitter death.

On the Atlantic eleven noble yachts are speeding to the eastward as fast as swelling canvas and straining sheets can drive them. The prize is the greatest that can be offered in our noblest field of sport; for the winning flag will represent, beyond dispute, the supremacy of yachting on the high seas.

On the Pacific, two mighty armadas are engaged in a life-and-death struggle, the like of which, we may say again, has never been witnessed in the history of the world. Two hundred modern ships of war, embodying, among them, the very latest constructive skill of the naval architect, and, on one side at least, the highest professional skill and leadership of the officers, and daring and devotion of the crews, are moving to meet in the shock of a struggle, the prize of which is an empire of fabulous wealth and untold possibilities.

Is there not something of encouragement and sincere gratification to be found in the fact that at this hour a peaceful struggle between less than a dozen yachts for a golden cup should so completely have absorbed the interest of the public as to make them lose sight, for the moment, of the stupendous conflict impending in far eastern waters?

Of the yachting contest, we have spoken at some length on another page. In forecasting the possible outcome of the great struggle between the fleets under Togo and Rojestvensky, we must be careful to bear in mind that any mere tabular statement of the material contained in the opposing fleets may be very misleading. Before we can judge the actual fighting strength, we must know something of the quality of the material, its age, and its efficiency—considerations which might easily change a balance which seemed to be in favor of one fleet until it became a balance entirely in favor of the other. To make clear our meaning, let us take the case of the total number of heavy armor-piercing guns carried by each fleet. One might say, remembering that the battles of the war have been fought at long range, that only guns of 9, 10, and 12-inch caliber should be reckoned as effective in a fight between armored vessels capable of standing in the front line of battle, and that only heavily-armored ships of the battleship and coast-defense type should be included. Judged on this basis, and disregarding any other considerations, Rojestvensky would appear to have a sufficient preponderance of gun fire to absolutely crush Admiral Togo and sweep him from the eastern seas. Now that Admiral Nebogatoff has effected a junction with the Baltic fleet, Rojestvensky can theoretically put into the front line of battle eight battleships and three coast-defense vessels, carrying between them a total of forty-five heavy armor-piercing guns of from 9 to 12-inch caliber, and of these twenty-six are 12-inch guns. Against these Admiral Togo could put in the first line only five battleships, carrying twenty 12-inch guns.

When we come to look into details, however, we find that although the Japanese have a numerical inferiority so great, their ships are all modern, and their guns of high velocity. Among the Russian battleships three, at least, are so old and their heavy guns are of such short length and low velocity, that they must be reckoned as distinctly of the second class; while one of them, that is protected with compound armor, must be reckoned as almost obsolete. Furthermore, the 9-inch guns are of such low velocity and limited carrying power that they have less penetration by fully thirty per cent than the 8-inch guns carried by the Japanese armored cruisers. If these older battleships are fit to fight in the first line of battle, so surely are the eight armored cruisers of the Japanese, with their high-velocity 8-inch guns, of which they mount thirty-two altogether, and their 7-inch face-hardened armor, which is probably as effective at long ranges in bursting and breaking up armor-piercing shells as the soft, compound armor carried by at least one of the Russian battleships. Add to these facts that the Japanese have an overwhelming superiority in light cruisers, scouts, and torpedo boats; that they are fighting in or near their home waters; and that the Russian fleet depends for coal upon colliers that are liable to capture when once the fleet has passed into Japanese waters, and it will be seen that the total advantage does not by any means lie with the Russian fleet, powerful though it be.

COMPLETE THE COAST DEFENSES.

On January 16, 1886, the Endicott Board of the army outlined a system of sea-coast defense for the adequate protection of our seaboard. During the past nine years work has been done on the emplacements and the guns as fast as appropriations by Congress would allow. Up to date $110,000,000 has been expended; and it is estimated that it will take $65,000,000 more to complete the work. The guns already emplaced include ninety-three 12-inch, one hundred and nineteen 10-inch, ninety-three 8-inch, three hundred and fifty 12-inch mortars, and one hundred and eighty-five rapid-fire guns. This means that eighty-three per cent of the heavy guns, sixty-six per cent of the 12-inch mortars, and fourteen per cent of the rapid-fire guns required for our coast fortifications are already mounted. So far, so good.

Unfortunately, as matters now stand, the value of this fine equipment is reduced by about sixty-six per cent, because it is not provided, or is very ill-provided, with the range-finding apparatus which is necessary to the efficiency of a modern long-range battery.

Unless big guns of 10 and 12-inch caliber be provided with accurate range-finders, they cannot make good shooting beyond ranges of two miles; but with accurate range-finders, these guns are effective against the enemy up to an extreme range of six miles, and the smaller caliber guns at proportionately decreasing distances. The ineffective work done by the heavy guns at Port Arthur against the Japanese fleet has been a matter of general comment, and the following explanation has been given by the Russian general of artillery, Martushev: "The remarkable action of the Quantoon fortress artillery," at Port Arthur, "as manifested during the repulses of the Japanese fleet, leaves nothing to wish for in what concerns the shooting at middle or short ranges. But when the ranges are 10,000 or 12,000 meters, this artillery does not shoot at all, or fires without results. If it were otherwise, it could never have happened that the bombardments at Port Arthur, lasting sometimes several hours without interruption, were without results, when under the circumstances every minute ought to have caused the loss of some ship, small or big."

Brigadier-General J. P. Story, chief of artillery, U. S. A., states in his last report that it would be impossible, if the position-finding equipment were completely installed on our fortifications, for hostile vessels to remain at 10,000 or 12,000 meters from our batteries of 12-inch guns or mortars for two or three hours, and not be destroyed. He then proceeds to make the following astounding statement: *"I regret, however, to have to say that even at this date most of our fortified harbors are no better supplied with position-finding equipment than apparently is Port Arthur."*

Evidently some of the amazement which we have been expressing at the apparent lack of preparedness of the Russian authorities, displayed at Port Arthur, may well be reserved for the extraordinary condition of things thus revealed in our own defenses.

In its annual report of 1903, the Board of Ordnance and Fortification recommended that $2,000,000 be appropriated each year for the next few years, for range-finders and other instruments for fire control, etc., and stated that it was aware of no object for which sums of money could be more effectively expended, or from which greater benefit would be derived. In its annual report for 1904 the Board made the further statement that, in the present state of coast defense, money can be more advantageously expended for fire control than for any other permanent installation.

It has been a characteristic of modern military inventions during the past few years, that several small and comparatively inexpensive devices have been produced which enormously increased the effective value of heavy and costly war material. We may mention the soft cap for armor-piercing projectiles, the telescopic sight, and the modern position or range finder, now under discussion. So great is the influence of such inventions, that their possession by one of two contending forces might easily determine the fortunes of a battle, or even of a whole campaign. As one illustration of this, we may mention that in the naval battle of August 10, the Japanese did and the Russians did not carry telescopic sights on their guns—a difference which in itself was quite sufficient to determine the issue of that fight.

We commend these facts to the careful consideration of Congress, to whom it must surely be evident that no appropriation could be granted to better effect than the annual $2,000,000 necessary to render our present costly coast defenses fully efficient.

THE INTERNATIONAL RAILWAY CONGRESS.

Although the International Railway Congress in Washington was primarily a gathering of the foremost railroad men of the world for the discussion of the technical and commercial side of the great subject of railway transportation, the exposition of American railway appliances, which was held on the grounds adjoining the Washington Monument, played a most important part in connection with the great international gathering. Although it was understood that the foreign delegates would travel widely in the United States before returning to their various and widely-scattered homes, and would, therefore, have the opportunity to become acquainted with the American railroad in its active operation, it was realized that the limited time at their disposal would prevent many of them from obtaining as intimate a view of our railway plant and appliances as they might wish to secure Hence the suggestion, which soon took practical shape, to hold an exposition of railway material at Washing-