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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 WRECKED NEW HAVEN CAR IN THE TUNNEL ACCIDENT.

In the thorough discussion of the recent New York Central tunnel accident which is now taking place, there is one most important point which is apparently being overlooked. On the evening of the day of the accident, outgoing passengers through the New York Central yards were attracted by a bonfire which was blazing fiercely on one of the side tracks. The material of this bonfire was the wrecked passenger coach in which seventeen lives had been lost a few hours before. Employés of the railroad were attending the car and seeing to it that every vestige of the woodwork was destroyed. We consider that in view of the enormous value of every scrap of material evidence that might throw light on this calamity, and enable the Coroner's jury and all subsequent investigating bodies to learn the true lessons of the disaster, it is extremely regretable, to say the least, that the company should have deliberately wiped out of existence this car, with the technical evidence that it would have afforded. There were two elements that contributed immediately to the magnitude of the disaster. One, the speed and momentum of the New York Central train; the other, the strength of the New Haven car, and its greater or less ability to offer that resistance to crushing and telescoping which every properly constructed, modern passenger car is supposed to possess in a very large degree.

One of the first things observed when the New York Central engine was backed out of the wrecked car of the New Haven train was the curious fact that the extension smokebox of the locomotive, whose front door had been burst in, was filled full of a substance that looked very much like sawdust. Where did this pulverized wood come from? When the engine drove its cowcatcher under the rear of the New Haven coach, its first action must have been to lift the floor of the coach until the floor and frame of the coach were level with the saddle and smokebox of the engine. The center longitudinal sills were probably struck by the unyielding saddle and tube-plate of the boiler. Had these car sills formed a portion of the thoroughly braced and tie-bolted under-frame of a modern car, they would have shown sufficient strength, one would have thought, to transmit the shock of the colliding engine throughout the whole length of the train. Apparently the shock transmitted was so out of all proportion as to suggest that the car platform crumpled up before the engine like the proverbial eggshell. Was the disintegrated wood that filled the smokebox of the engine and was scattered over the front platform sawdust that had been used as a sound-deadener in the floor, or was it the wreck of the framework? If the latter, and the car timbers were sound, a carbuilder would have looked to find splintered instead of pulverized wreckage. It is an interesting point well worthy of investigation.

Just now, a few specimens cut out of these sills and put through a testing machine to determine their quality might have an extremely important bearing in the present investigation. Possibly the railroad companies were careful to save such specimens before they destroyed the car. In any case, we think the custom of burning up a wrecked car immediately after a wreck is greatly to be deprecated.

A significant fact in connection with the question of the behavior of the car is the general testimony of travelers on the New York Central train that they experienced a comparatively light shock at the time of the collision. The crushing in of the enormously strong floor and framing of a modern passenger car should have given the heaviest kind of a shock to the passengers on both trains. It is said that the wrecked car was only twelve years old; but whether this is the case or not, it is sincerely to be hoped that one result of the present disaster will be that the New Haven Railroad will take out of service several old, and therefore necessarily weak passenger cars, which are to be found on many of the local trains that are running to this city.

THE ELECTRIC ELEVATED TRAINS.

The electric train which is now running on regular schedule time on the Second Avenue line of the Elevated Railway Company has served to show that the new system is an unqualified success, and that the claims as to speed, ease of control, and comparative absence of noise, that were made when the change was projected, are fully justified. It is possible to acquire a speed of 15 miles in ten seconds after starting a train, and it is expected to run express trains at 40 miles an hour when the service is more fully developed. The present train consists of two motor cars and a trailer between them; but the ordinary train will consist of five cars, while in rush hours six-car trains will be run, which will be made up of four motor cars and two trailers. Each of the motor cars will be equipped with two 150-horse power motors, thus giving a total horse power of 1,200 for the whole train. The weight of the motors will aggregate 35,000 pounds. The present locomotives weigh 46,000 pounds, or 11,000 pounds more than the combined weight of the eight motors. Altogether 1,800 of the new motors have been ordered to take the place of the 300 locomotives which have hitherto been necessary to serve all the lines of the elevated system. The eight motors of the train will be controlled by one motorman in a cab at the front end of the leading motor car. The movement of the controller in this cab operates magnetic switches on each motor car in the train, and thus every motor is operated simultaneously by the turn of a single lever. Each motor car is equipped with an electrically-driven air compressor for supplying the necessary pressure for the Westinghouse air-brake, with which all the cars will be fitted. This equipment will take the place of the old Eames vacuum brake with which the cars are at present equipped, and it will enable the motorman to bring the trains up to the stations at a higher speed and stop them at shorter distances than is at present possible. There will thus be a gain in time both in accelerating and retarding the train, and the more powerful brake control will, of course, conduce proportionately to the safety of travel.

TARGET PRACTICE IN THE UNITED STATES NAVY.

It is announced on high authority that in the recent quarterly target practice of the North Atlantic Squadron the ammunition employed footed up to an equivalent of $178,000; or, in other words, more ammunition was fired away in gunnery training than was expended in the battle of Manila. It was this prolonged, and even excessive, firing that was maintained by the ships of the fleet that caused certain weaknesses to develop in the deck supports of the battleship "Alabama." The buckling of beams and angle-irons on that vessel was in no sense due, it is declared, to the premature explosion of shells in the 13-inch guns, but was caused by an inherent weakness of structure which only heavy firing was able to develop.

The premature explosion of 13-inch and 6-inch shells on various vessels of the fleet has been followed by a rigid inquiry into the causes of such accidents, and ordnance officers are now satisfied that the trouble has been due to inefficient gas-fitting devices about the shell bases. It was at first feared that the walls of the common shell were not sufficiently strong, and that fragments of the walls were detached from the interior at the instant of firing and projected through the powder charge. Experiments and tests carried out at Indian Head have given every assurance that the shell walls possess requisite strength. Equally gratifying results were reported from the fuse tests, for in order to make sure that the premature bursts did not emanate from the detonators, exhaustive trials were conducted with a view to detecting the slightest weakness, if any existed, in the fuses. The fuses were found beyond a shadow of doubt to be absolutely safe and thoroughly reliable in action.

With the shell walls and fuses proven satisfactory, the only conclusion open pointed to defects in the shell bases, and under hydraulic pressure it was found possible in a number of instances to force water through the screw threads. In firing work the pressures in the chamber of the gun mount as high as 17 tons per square inch, and evidently where water can be forced gases will penetrate under such enormous pressure. The opinion now holds among the ordnance officials that the premature explosions on the "Alabama" were due to gases effecting an entrance into the shells around the base plugs—a defect that can be easily remedied in future shells.

It is estimated that the annual expenditures in target practice in the United States service will very shortly approximate $1,500,000. Prior to the Spanish-American war the heaviest expenditure was in 1897, when nearly $700,000 was used up in gunnery training. Now, as then, the ammunition allowance per man is greater, it is believed, in the American navy than in any service afloat.

Radical changes have been made of late in the forms of targets employed. Prior to 1898 the triangular target supported on spars lashed to three barrels was in common use, whereas to-day a rectangular target built of wire netting and supported on a raft is the popular form. The rectangular target may be taken in tow and a speed of ten knots secured without fear of towing the raft under or capsizing it on short turns, provided always that some additional spars are taken in tow to serve as holders-down. Red, it has been found, is the best color to paint the wire netting, and at considerable distances a shell hole in the target shows up very distinctly.

The splendid qualities of the new American navy smokeless powder make possible the continued and long firing on the part of our guns, something which is not possible with cordite and some other smokeless powders now in use in foreign services. Sub-caliber tubes are employed on United States ships; but generally speaking, target practice is with full charges. With the machine and smaller guns of the secondary battery there is practically no limit to the ammunition expenditure permissible. A limit is fixed in the heavy guns, but from what can be learned the greatest liberality seems to exist, and some of our commanders are complaining of lack of ammunition. Very recently the cordite ammunition purchased in England for the batteries of the cruisers "Albany" and "New Orleans" was condemned and American smokeless powder substituted. No particular fault was found with the cordite, except that it did not stand up to the work as well as American powder. It is estimated that a 6-inch gun using cordite will lose its accuracy entirely after 175 shots, provided initial velocities of 2,700 foot-seconds be imparted. To prolong the lives of their guns the English are keeping the muzzle velocities of the majority of their guns under 2,500 foot-seconds. In the American service 2,800 and 2,900 foot-seconds service initial velocities will be used on the new guns, and the life of a 6-inch American navy weapon can only be conjectured, for it has not yet been determined in service.

The methods of selecting gun captains in the American navy is practically the same to-day as before 1898. It is laid down as a hard-and-fast rule that before a man can be advanced to a high number at the gun he must first have demonstrated that he is a first-class shot with the rifle and revolver; in other words, the initial training commences on the small-arm firing range. From No. 3 or 4 at the gun the seaman is advanced when he has made suitable proficiency to second gun captain, and if he is an exceptionally good man he may hope for special and higher training on some gunnery vessel. The work of training gun captains is intrusted at the outset to the divisional officers; but later it may be taken up by special officers detailed to instruct on the gunnery ships. But back of all systems is the imperative demand for ammunition to carry into effect the gunnery instructions, and in this respect the policy of the Navy Department has been to provide an allowance of a most liberal sort.

The fact should not be overlooked that our new smokeless powder is not as light in weight as cordite and some other foreign powders and we are, therefore, compelled to carry more dead weight of ammunition than English ships. This fact necessitates greater magazine room, and some slight disadvantage in loading rapidly, but these handicaps are far outweighed by other considerations of greater importance which are all in our favor.

A NEW TRADE ROUTE TO PERSIA.

A new trade route to Persia, via Nushki and Seistan has been opened. Hitherto the trade of Persia has been controlled through three main entries, namely, through Caucasia and Transcaspia in the north, and through the Persian Gulf in the south. The two northern entries are entirely under the control of Russia, while England has always been a predominant power in the Persian Gulf. If, however, the Eastern markets require English goods they have to be carried by caravan across the Dashtidut. This places goods entering Persia from Askabad, which is only 150 miles from Meshed, in a predominant position in Khorassan, which has for centuries been one of the richest provinces of Persia. It is this country, which the Nushki-Seistan route is to feed with Anglo-Indian goods. The Indian railway only reaches as far as Quetta, from which place Nushki is 96 miles distant, and though the country between these two places has been surveyed, at present all caravans start from Quetta, in order to be in communication with the railway. The country between Nushki and Seistan is an absolute desert. The camel grazing is excellent for the whole of the way. Robat is the last British post, and the distance can be accomplished in eighteen marches—5 to Dalbindin, 3 to Merui, and 10 to Robat. As far as Dalbindin the water supply is excellent, and sweet water is obtainable on the present route to Merui. Between Nushki and Dalbindin mud bungalows are being erected at every stage, but from Dal-