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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.

STEEL AND WOODEN CARS IN THE SUBWAY FIRE.

Again the all-steel car has proved its superiority to the wooden car, this time under the double test of collision and fire. Not that the all-steel car needed any further proof as to its high qualities of resistance either to fire or shock, for its behavior both on steam railroads and in the eighteen months of operation of the Subway, had made it clear to every practical mind that it was the car of the future. What renders the recent accident particularly convincing is the fact that of the two cars which were at the ends of the colliding trains, one, a wooden car, was badly shattered and practically consumed, while the other, a steel car, received comparatively little structural injury and was only slightly injured by fire.

The accident was due to carelessness in switching a train of empties onto a third track, which, temporarily, was being used as a storage track. The force of the collision was sufficient to derail the front truck of one car and throw it against the third rail, with the result that there was a heavy short-circuit. The two last cars of the train which was run into were of wood. These instantly caught fire, the first of them being entirely destroyed, and the second car partly so. The damage to the steel car was confined to a portion of the wooden floor and the rattan of the seats, these being the only portions of the car that were inflammable, if we except the window sashes. It would, of course, be desirable to abolish even these inflammable materials, and the steel cars could be rendered more nearly fireproof by constructing the floor of steel plate overlaid with fireproofed hardwood strips, and by substituting steel or bronze sashes in the windows. As for the rattan, which is needed for comfort, it should be possible to treat that with some fireproofing solution.

The burning of these Subway cars has naturally excited some measure of public distrust of the wooden car; while that portion of the daily press which is only and ever seeking what it may condemn, and shutting its eyes to what it might approve, has been censuring the Subway operating company for running any wooden cars whatever on the system. Now, as a matter of fact, the wooden cars which were brought out some three years ago were built with a special view to the prevention of fire, the sides being copper-sheathed, and fire-resisting materials being worked in at all points which are in proximity to the electrical appliances. At the time they were built, they represented the most advanced ideas on fireproof construction. Five hundred of these were ordered by the Subway company two years; and to further insure the safety of the rolling stock and the public, the remaining three hundred cars that were required were voluntarily ordered of the present steel construction. These cars are more costly, are heavier and more destructive to the track, and therefore more expensive in operation than the wooden cars. The fact that they were voluntarily introduced is distinctly to the credit of the Subway company. It has been rumored, however, that with a view to reducing the cost of equipment, no more of the steel cars will be built. We have failed to verify this rumor, and the Rapid Transit Commission would in any case prevent the introduction of more wooden cars into service, the Chief Engineer in his report on the fire having recommended that no inflammable material be used in future cars.

A feature of the recent fire that excited much apprehension was the immense volume and pungent character of the smoke that resulted from the burning of so much insulated material, grease, and painted wood. Naturally this was strongly suggestive of the terrible fire in the Paris Subway, a few years ago, when so many died of suffocation. The public, however, need have no apprehension on this score, if the system of ventilation which the Rapid Transit engineers have designed be installed throughout the system; for it will render it possible to renew the whole atmosphere of the tunnel so quickly, that the smoke of a fire could never accumulate to the point of suffocation. This is a feature of the ventilation improvements which, of itself, would be sufficient to justify all the expense.

In an official report to the Rapid Transit Board, Chief Engineer Rice made the following recommendations:

1. That no parts of cars used in Subway service should be constructed of inflammable material.

2. That an adequate fire-line service should be installed throughout the whole subway, so that water can be had at interior points.

3. That means should be provided for quickly removing the smoke from the Subway in emergencies.

The question of the authority of the Board to compel the operating company to carry out these regulations is dependent upon the interpretation the courts may put upon the contract stipulation that the company shall provide such equipment as meets the approval of the Board.

OCEAN RACES FOR SMALL BOATS.

Although we are thoroughly in sympathy with the present effort which is being made to promote deep-water sailing, and encourage our amateur yachtsmen to gain that experience in navigation which can only be obtained when one is dependent upon the sextant, the compass, and the nautical almanac, we think that the recent offer of a cup for a race from New York to Bermuda was a case of pushing a good principle a little too far. The fact that two of the three boats that started made the trip in safety must not shut our eyes to the fact that the venture was attended with unusual risk of disaster. In the eyes of nine yachting men out of ten, it will appear that the restrictions as to size were placed entirely too low for a race of this character. While we have every admiration for the pluck and skill of the skippers and crews of the thirty-eight and twenty-eight-foot boats which completed the race, we cannot but think that the starting of such a diminutive craft as "Gauntlet," whose length on deck is only twenty-eight feet and her water-line length about twenty-two feet, was an altogether needless imperiling of the lives of the four amateurs that formed her crew.

The facts which rendered the trip particularly hazardous are that no professional was allowed on any of the boats; that for hundreds of miles the little yachts were far from any port which they could make, in case of the carrying away of spars or dismasting; and that they were out of the regular line of steamer travel. A strong hint of danger was given shortly after the start of the race, when one of the yawls carried away one of her spars, and was detained two days in port before she could be put in shape for another start. As we have said, we are fully alive to the advantages of ocean races, such as that over the outside course off the Long Island shore, or the race held last year from New York to Hampton Roads. Here, in case of disablement, some port is always within reach, or the small craft, if disabled, will probably be spoken by passing ships.

The performance of the winning boat "Tamerlane," a yawl measuring thirty-eight feet on deck, which also won the last year's ocean race to Hampton Roads, was extremely creditable to the boat, her crew and her skipper, who by the way is the editor of our esteemed contemporary, The Rudder. She averaged over the whole course between five and six knots an hour, and the publication of the log of the little craft will be awaited with much interest in the yachting world.

A DECADE OF WIRELESS TELEGRAPHY.

Wireless telegraphy is now ten years old. On the 2d of June, 1896, there was filed in the British Patent Office a provisional specification "for improvements in transmitting electrical impulses and signals and in apparatus therefor," by one Guglielmo Marconi, residing at No. 71 Hereford Road, Bayswater, England.

At the time this patent was applied for the art of transmitting messages without wires was wholly unknown, in so far as its practice and utilization were concerned, and the drawings and description of the improvements cited gave neither the layman nor scientist an inkling that the arrangement was one of the most important since those first brought out in the allied classes of telegraphy and telephony, or that the young inventor was destined to take rank with Morse and Bell as a genius who had materially advanced civilization by devising a new means for the transmission of intelligence.

Exactly a decade has elapsed since the filing of that memorable patent, and the great and far-reaching progress made in the art in the brief period past is well known. There are, however, some salient features that have been brought out in the development of the new telegraphy that are not so well known, and to these attention may be appropriately called at this particular time.

After the first successful trials were made across the Bristol Channel between Lavernoch and Flat Holm, a distance of 3.3 miles, by Marconi, and during these notable tests, in which he became cognizant of the great value of using high aerial wires and earthed terminals, the feasibility of telegraphing through space without wires by the Hertzian wave method could no longer be doubted, and all other schemes for producing similar results were abandoned.

Notwithstanding the favorable issue of the experiments, there was yet much to be done before the system could be made commercially practicable, and the young inventor labored zealously to extend the limitations that hemmed it in on all sides. Nor was he alone now in the great work that confronted him, for numerous investigators on both sides of the Atlantic became imbued with the possibilities the new art offered. To increase the range of signaling was the first and most important step, and after that, the desirability of securing selectivity, so that a number of messages could be sent in the same field of force without suffering extinction.

Marconi was perhaps the most persistent experimenter in the bridging of greater distances, while very early in the development of the new telegraphy Lodge turned his attention to the production of a selective system by means of electrical resonance. The former succeeded so well in his task, that from three miles in 1897 he was enabled to send and receive signals three thousand miles in 1904; while the latter, although he failed to evolve a commercially selective apparatus, led the way for the timing of the sending and receiving circuits individually and syntonizing them collectively.

The work of Lodge and his successors has resulted in the beautiful compound open and closed oscillators and resonators, both close and loose coupled, that give, in the refined apparatus we have at the present time, the highest efficiency of operation with the least expenditure of initial energy.

Another important feature of recent date is the utilization of auto-detectors in connection with telephone receivers as receptors for the translation of incoming electric waves into the alphabetic code of dots and dashes. This adjunct may be attributed to American ingenuity, and was a difficult but well-taken step leading toward the goals of accuracy, rapidity, and simplicity, for it eliminates virtually all of the difficult adjustments found in the coherer and Morse register receptors, permitting a very great increase in the speed of reception, and greatly reduces the number of essential parts of the equipment. De Forest was probably the first in the commercial field to use the auto-detector and telephone receiver, while Fessenden has conferred a lasting benefit upon science and humanity by his ingenious detector, the liquid barretter, an instrument that in its sensibility, its ruggedness, and its simplicity is second only to the telephone receiver of Bell.

With these improvements, chiefly made within the past five years, wireless telegraphy is all that the most exacting critic could hope for, if we except selectivity, and in this especial branch of the work there is yet unlimited opportunity for the wireless inventor to exercise his ingenuity.

So much for the physical advances made during the past decade, in transmitting messages without wires. Its usefulness as a commercial factor has been universally recognized, and not only has the mercantile marine service been very largely equipped, but the different governments are fully alive to its possibilities in time of peace and war. Not only have the ships of the world's navies and strategic shore stations been equipped with some make of apparatus, but the armies of various countries have used it overland with considerable success.

Overland wireless telegraphy has been tried out commercially within the past few years; and while it is practical from the viewpoint of operation, the interference between stations leaves it a poor competitor of the wire system. It has competed more successfully with the shorter cables, and elaborate experiments are now being conducted by Prof. Fessenden and Dr. De Forest, working independently in the effort to establish permanently transatlantic cableless telegraphy. Should the results prove practicable, it is extremely doubtful if they will in any way affect the cable companies, as is popularly supposed.

The wireless patent situation has been aired in the United States courts to some extent, and it would seem from the decisions handed down that the claims of Marconi in his original patent of ten years ago, i. e., "a receiver having a sensitive tube or other sensitive form of imperfect contact capable of being restored with certainty and regularity to its normal condition," will be upheld during the life of the patent. As a matter of fact, the electrolytic detector or barretter of Fessenden comes under this claim, although this question has not been answered by process of law.

The present indications are that there will be no litigation between the Marconi and Fessenden interests; and in so far as the United States is concerned, there is reason to believe that of the several companies now making and selling apparatus, many will be driven entirely out of the business, one or two will be allied with the Marconi company, and the fittest only will survive, forming a parallel with the inter-