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(Illustrated articles are marked with an asterisk.)

SERIOUS MARINE DISASTERS.---IMPROVED SAFETY APPLIANCES GREATLY NEEDED.

A fearful record of loss, both of property and life, has filled the columns of the daily press during the past week. The somber category shows four fine vessels of our merchant marine totally wrecked and scores of human lives sacrificed.

The propeller Metis, plying between New York and Providence, on the morning of the 29th of August last, while in Long Island Sound, five miles off Watch Hill, Rhode Island, came in collision with a coasting schooner and speedily sank. As the ship sank, her spar deck was lifted bodily clear of the hull, and remained on the water a floating raft, thus saving many passengers who would otherwise have perished. As it was, some forty lives were lost.

The Metis was constructed with three compartments formed by bulkheads placed athwart her hold. It is stated that she had just been thoroughly refitted, and was to all intents a new vessel. How "thoroughly" this work was done is amply evidenced by the fact that two compartments, which should have remained intact and floated the vessel, even if the third had filled, must have given way—the bulkheads bursting in—so that they were no protection whatever.

There is no subject which calls for peremptory legislation more than the proper construction of the hulls of vessels. The compartment system should be made obligatory in every passenger ship, and the spaces divided off should be actually, not theoretically, watertight, and totally distinct from each other. Cases are numerous where the safety of vessels has been solely due to this method of construction. The collision off Newfoundland, resulting in the sinking of the ill fated Arctic, injured the propeller which she struck only to the extent of breaking in a portion of one of her compartments, which did not prevent her from making the nearest port in safety. The Great Eastern, built with a double skin and amply strong compartments, struck on a rock, during her passage through Long Island Sound, tearing open the plates of her bottom for a length of some twenty feet, and yet no difculty was experienced in keeping her afloat. On the other hand, the terrible calamity of the United States frigate Oneida, which had no compartments, and consequently foundered a few minutes after being injured, is yet fresh in the public mind. In our own experience, we have seen one of the largest and most powerful steam frigates in the navy compelled to bring by the wind, shift all her guns and heavy weights, and range all her crew to leeward, in order to heel her over sufciently to raise the outboard delivery opening, which is below the water line, out of water. Some of the valve gear had been carried away, and a stream of water twenty inches in diameter had already risen above the fire room floor and menaced the fires. Luckily the weather was calm and the sea smooth, as otherwise the difficulty in stopping the leak would have rendered the ship in imminent danger. Had she been properly constructed, a single compartment would have filled and there the mischief would have ended.

The great corporations owning lines of steamers, though lavish in expenditure for elaborate upholstery and gorgeous decorations, with strange inconsistency are parsimonious in the extreme in matters of the most vital importance regarding the safety of their vessels and passengers.

The cases of the side wheel steamer Bienville, of the Pacific Mail Company, which was burned at sea on her passage from New York to Aspinwall on the 5th of August, also of the America, another large steamer belonging to the same company, burned at Yokohama, Japan, August 24, and that of the propeller Nevada, consumed by fire in New London harbor on the 31st of the same month, are similar in many respects. Both doubtless owe their loss to spontaneous combustion taking place in their cargoes. The Bienville, though fitted with steam pumps and other fire extinguishing apparatus, found in the hour of danger that they were useless.

Complete immunity from the dangers of marine conflagrations we hardly expect. As if in mockery of man's best efforts, the news comes to us from Yokohama (Japan) of the burning of the magnificent steamer America, belonging to the Pacific Mail Line, and one of the largest side wheel vessels in the world, in the harbor of that city. She contained every improved appliance, and her fire regulations were supposed to be nearly perfect. She arrived at Yokohama on the morning of August 24, and at 11 o'clock on the same night the freight deck took fire, and immediately the whole ship was enveloped in flames, defying all efforts to extinguish them. The vessel was totally destroyed, together with the mails, freight, and the luggage of the passengers and officers. The rapid progress made by the fire forced all hands to jump into the water, there not being time even to lower the boats. The America measured 4,454 tuns, hull of live oak, divided into compartments by means of three bulkheads. Her engine was 2,230 horse power, steam cylinder 105 inches in diameter, piston stroke 12 feet, wheels 42 feet diameter, 12 feet face; four boilers, each having six furnaces.

For use, in case of fire or leakage, the vessel is said to have been provided with an independent boiler and pump upon each deck, throwing from seven to ten streams, besides other devices for extinguishing fire.

There seems to be no really valuable system for extinguishing fire aboard ship. Even closing all hatches and ports does not render the hull airtight, and unless it is very nearly so, jets of steam or of gas from extinguishers are of little avail. A mode of completely flooding a vessel is needed, and the subject is worthy of the attention of inventors. We published, a short time since, a valuable method of laying pipes through factories and other large buildings, by means of which the most spacious apartment can be completely drenched in a few seconds. Repeated tests have proved the efficiency of this system, which may be easily modified for vessels. We are of opinion that owners should be compelled to locate pipes through which water might be forced into every part of the cargo without breaking bulk, and more especially should this be insisted upon in cases where, like that of the Nevada, the vessel is loaded with dangerous materials.

CAR COUPLING DANGERS.

We publish in another column the letter of an esteemed correspondent, who complains very strongly against the railway companies for their neglect in not supplying proper means or enforcing proper regulations for the coupling of their cars. It is undoubtedly true, as he states, that many lives are annually lost, and many families reduced to bitter distress in consequence of this neglect.

How to remedy the matter in an effectual manner appears to be a question somewhat difficult of solution.

The common method of coupling is by means of an open link, each end of which is secured in the end of the platform buffer or drawhead by means of an iron pin. In the act of coupling, it is common for the brakeman to stand between the two cars that are to be connected, for the purpose of holding up and guiding the link into the mouth of the opposite buffer; the engineer now backs the train, and, as the cars approach, the brakeman directs the link with one hand and with the other drops in the pin when the link has reached its place in the buffer. This is a quick and simple operation, and would not be especially dangerous if the track were always level, the cars all of uniform weight, and engineers always careful and dextrous in the management of their locomotives. But such is not the case, and the cars are sometimes brought together with such rapidity and force that the poor brakeman is crushed before he can jump out from between them.

Of all people in the world, railway operatives are the most reckless in regard to their lives, which they do not hesitate to hazard for the purpose of saving themselves the slightest trouble. This matter of car coupling is an example. We believe it to be entirely unnecessary for the brakeman to stand between the cars in the act of coupling. He may stand upon the platform and, by the use of a loop of twine or a crooked stick, hold up and direct the link into its proper place, and so avoid all danger to his person. But this precaution is attended with the trouble of climbing to the car platform, providing the string, keeping it always in readiness, etc. Rather than do this, he recklessly places himself between the cars, and runs the terrible risk of his life.

Multitudes of self acting car couplers have been invented, and some of them have been brought into use. But the link and pin is so simple, so well adapted to cars of varying hights and sizes, so easily renewed when broken, so quick, effective and safe if properly treated, that their displacement by a more expensive or complicated device is difficult, if not impossible.

We should be glad to receive the views of other correspondents upon the subject, especially of practical railway men.

AN AUCTION SALE OF MODELS AT THE PATENT OFFICE.

For the past few years the Commissioner of Patents has been puzzled to know what to do with the great number of models of rejected applications which have accumulated during more than thirty years, and occupying, as they have done until the past year, the whole of the west wing of the model room in the Patent Office. But an act of Congress, approved July 8, 1872, solved the problem, by authorizing the Commissioner of Patents to restore to the respective applicants such of the models, belonging to applications that have been finally rejected for one year, as he should not think proper to be preserved, or to sell or otherwise dispose of them as he might think proper. In considering in what way he could dispose of these models, he conceived the idea of using them to educate the youth in the different institutions of learning throughout the country, and accordingly, by an Associated Press dispatch, made known the fact that such institutions of learning as desired the models could have them, subject to a stipulation that they were to be preserved in good condition and returned to the Office upon the order of the Commissioner. This was a little more than a year ago, since when some seventy iustitutions have availed themselves of the privilege afforded of getting these models, and have received in all upwards of seventy thousand of them. Each institution sent a representative, who selected such of the models as he thought proper, and of these was made a list, which is preserved by the Commissioner, so that, in the event of any of the models that have been given out being required, the Office can obtain them. Of the models not wanted by any institution, there were some thousands, mostly in a broken and dilapidated condition; and these were a few days since sold at auction, in accordance with an advertisement which had appeared in the papers for a month previously. On the day of sale, the models and fragments were heaped together in sixty lots on the floor of the west hall of the Patent Office building, and the sale of them realized to the Office between seven and eight hundred dollars only, the prices varying from five dollars to one hundred and twenty-five dollars per lot. One lot of lamps sold for forty dollars to a gentleman, to be taken to Chicago; and another, a lot of sewing machines, some sixty in number, together with a quantity of odds and ends of sewing machine attachments, brought sixty dollars.

THE CINCINNATI INDUSTRIAL EXPOSITION.

The third Industrial Exposition in Cincinnati opened on September 3, and, we are informed, will surpass anything of the kind ever before held in that city. The buildings devoted to the fair have been greatly enlarged, until at present nearly four acres of ground are under roof, while altogether there are seven acres of exhibiting space. The exhibitors this year at present number 1,500, with 4,000 entries.

The premium list for this year is especially attractive. There are ninety medals of gold, three hundred and ten of silver, and three hundred and seventy of bronze, the whole costing some $12,000. The interior of the main hall is beautifully decorated, while the floral hall contains three miles of evergreens. The latter covers 21,000 square feet of ground space, and is surmounted by a roof containing 12,000 feet of glass. A superb display of rare and exotic plants, rustic work and ornamental gardening is to be exhibited. In the natural history department, which is not yet completed, innumerable fossils, skeletons and shells are being arranged. The power hall is not large enough, as it covers only about two thirds of an acre. Machinery of all descriptions will be represented. Fifteen engines are now in position, most of them running. Altogether over three hundred machines will be actually worked by steam power, the conditions of their exhibition being such that they will not be allowed to remain at rest. Wood working machinery, it is stated, will preponderate. The art hall contains five hundred oil paintings, contributed by citizens, many of which are by celebrated masters. Besides oil paintings, there will be a large display of water colors, engravings and photographs.

This exposition will be one of the largest ever held in this country and is especially remarkable as contrasted with its predecessors, which, though of much interest, were of no great magnitude. The railroads, extending in all over some 15,000 miles, communicating with Cincinnati have made liberal half fare arrangements, to continue during the fair, and the hotels of the city are making every preparation for the reception of the expected throng of visitors.

MEETING OF THE BRITISH ASSOCIATION.---ADDRESS BY A NEW YORK HERALD REPORTER.---LIVINGSTONE IN AFRICA.

The British Association met this year at Brighton, August 14, and on the next day Dr. Carpenter, the newly elected President, delivered his inaugural oration. But the great feature of a following meeting was the address of Mr. Henry M. Stanley, a correspondent of the New York *Herald*, who has suddenly achieved fame, if not fortune, by a successful adventure in Africa in search of the famous traveller, Dr. Livingstone. The Doctor had not been heard from for nearly three years, and much anxiety was felt in England in regard to his safety. The public interest in his behalf reached such a pitch that the Government finally organized an expedition for a search after the missing explorer, while a voluntary contribution for supplies and other assistance, amounting to some $25,000, was gathered. The starting point for these relief expeditions was Zanzibar, a well known settlement and steam packet post on the east coast of Africa, six degrees south of the equator. On this parallel, the width of the African continent, from the Indian ocean to the Atlantic, is only about eighteen hundred miles. The headquarters of Livingstone were known to be somewhere in the vicinity of a collection of native huts, designated as Ujiji, on the banks of a great lake, discovered by previous travellers, and called Lake Tanganyika. The route from Zanzibar to Ujiji is well known, distance about seven hundred miles, the first four hundred of which are very difficult to pass on account of the marshy nature of the ground and the extreme warmth of the climate.

The newspaper discussions, preparations and movements connected with the sending of the relief expedition excited