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(Illustrated articles are marked with an asterisk.)

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SCIENTIFIC AMERICAN SUPPLEMENT

No. 753.

For the Week Ending June 7, 1890.

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IMPROVED SHIPS AND LIFE SAVING DEVICES WANTED.

The recent experiences of several steamers plying between New York and Liverpool give renewed emphasis to the call for the invention of new and improved constructions and appliances for saving life and preventing accidents at sea.

On the 30th ult. the new and splendid steamer Normannia, 10,000 tons burden, 16,000 h. p., arrived at this port with part of her quarter rail carried away, having been in contact with an iceberg. Many bergs had been passed. Of a sudden, while going at full speed during a fog, a huge berg loomed up close aboard. By a quick and fortunate turn of the helm on the part of the captain, the ship's bow sheered off and avoided a bow contact, but the vessel swung so as to graze the ice with her stern quarter, breaking in the rail. Several tons of ice tumbled in upon the deck. It was a most narrow escape.

On the 26th ult. the Norwegian steamer Thingvalla arrived in this port with her bows badly crushed in, the result of a bow-on collision with an iceberg. Fortunately the ship was going at a reduced speed. The crash was terrific, the ice tumbled in upon the deck in great quantities, and the stem was torn open from the top to water line. The steamer backed off and stopped. By means of boards and cement the rent in the bow was stopped and the ship continued her voyage to New York. Here was another very narrow escape. On the 20th ult. the new ocean steamer Beacon Light reached this port with a leaky and battered bottom, due to collision with an iceberg. In this case, by a quick turning of the rudder, the ship sheered so as to receive, near the bow, a glancing blow from the berg, careening the ship, and bringing down many tons of ice, some of which fell upon the deck, causing the vessel nearly to capsize; while a great block of dislodged ice that fell into the sea came up under the ship and almost broke through the bottom.

These, we believe, are among the most serious accidents that have recently occurred from ice. They had their parallel in 1880, when the fast steamer Arizona, 5,000 tons, going at full speed, dashed bow-on into an iceberg. Her bow was torn open and the water poured in. Fortunately, the plates of the bow compartment were strong, remained uninjured, and the ship safely reached Newfoundland, off which coast the accident took place.

In the construction of the hulls, in means to ascertain the vicinity of ice in fog, in automatic devices for quickly turning and stopping the vessel, in boats, rafts, life preservers, in means for preventing the sinking of ships, there is abundant room for invention and improvement. Perhaps the greatest want of all is a ship that cannot sink, no matter where or how badly wounded.

THE NEW STEAMER NORMANNIA.

The latest of the superb Atlantic racers, the Normannia, of the Hamburg-American Line, arrived at New York, May 30, making, in her maiden trip, from Southampton, England, the distance of 3,059 miles in 6 days, 21 hours, and 53 minutes. This is within twenty-five minutes of equaling the best time yet made for a similar trip, but the most remarkable feature of the voyage was the narrow escape of the vessel from a great iceberg, which she met dead ahead on the afternoon of May 27, when running at the rate of seventeen knots an hour. Between dawn and dusk the vessel passed twenty-two icebergs, some of them said to have been quite two hundred feet high, but about five o'clock, during a slight fog, what was said to be the largest berg of all appeared directly in her path, and only about a ship's length away. It took but a moment for her captain to have her rudder turned for "hard a-port," and her engines reversed, but so quickly did the vessel respond to the electrical signals that she seemed to turn as if on a pivot, and merely grazed the great ice mountain, receiving some twenty or thirty tons of ice on her quarter deck. The escape was so narrow that the passengers could readily touch the great ice wall, and yet those in the dining room hardly felt the jar of the slight collision which took place, and came so near sending the great vessel with the 1,300 souls on board immediately to the bottom of the Atlantic.

The vessel is a twin screw steamer just completed by the Fairfield Engineering and Shipbuilding Company (John Elder & Co.), at Govan, on the Clyde. Three days after leaving her dock she made the trial speed of 21 knots on the measured mile and 20½ knots on a long run. Her makers guaranteed that her engines would develop 14,000 horse power, and they did better by 2,000. Her screws are smaller than those of any Atlantic liner with twin propellers, being only 18 feet in diameter. Her engines are of the triple expansion type, and have cylinders of 40, 67, and 106 inches in diameter. She has nine double-ended boilers, with eight furnaces to each. She is 520 feet long, 60 feet wide, and 40 feet deep, and measures 8,500 tons gross. Captain Charles Hebich, her commander, formerly had charge of the Columbia. He is commodore of the line. There are 316 men in the ship's company, 158 of whom work in the machinery department. Her coal bunkers have a capacity of 2,700 tons. She is divided into 17 water-tight compartments, formed by 16 bulkheads. She has a double bottom, the inner skin being four inches above the lower, except under the engines, where the difference is seven feet. The water space of this double hull is divided into thirty-six compartments, which will be used for water ballast.

A Sad Mining Accident.

At Ashley, Pa., near Wilkesbarre, on the 15th of May, a sad mining accident occurred, by which some thirty miners lost their lives. While the men were at work in their various chambers, a sudden inrush of air put out all the lights. The men congregated in the gangway, and, after consultation, explored every outlet, but without success. A party of three then tried to make their way out through an old opening in the hillside, the majority remaining where they were to wait till aid came. The exploring party came to where the air was better, when one of them, believing the air was so good there could be no danger, drew a match to light his lamp. Instantly a terrific explosion followed. All the men left behind were killed, thirty-one in number. Of the three in the exploring party, two survived and were rescued.

A correspondent sends us a sketch and description of a simple device for safely lighting a safety lamp. It consists in having a screw plug made to enter the side of the lamp. A pair of scratch plates are attached to the plug, and the match is introduced between the plates through a hole for that purpose in the plug. Contact of the match with the roughened plates ignites the match and lights the lamp wick.

Electric Light from Gas Engines.

A highly interesting fact has been brought out by Mr. O. Tirrill, of New York, in some practical tests in producing electric light by using illuminating gas for driving a gas engine and a Perret dynamo. Naturally one would suppose that the loss due to the double transformation of energy in producing the electric light from illuminating gas by this means would place the cost of the electric light far above that of gas. On the contrary, however, Mr. Tirrill has found to his surprise that a given amount of gas will produce far greater illuminating effects when used to drive this dynamo than when burned direct. The gasolene gas is produced by his machine for one dollar per thousand feet. The engine, it is found, consumes four feet of this gas per sixteen candle power lamp per hour when driving the dynamo under full load, making the cost per lamp two-fifths of a cent per hour, so that the luxury of the electric light by this means, instead of being expensive, he finds in reality to be a great economy. Mr. Tirrill explains the phenomenon by the fact that the gasolene gas contains eighty per cent of air when delivered at the explosion chamber of the engine, and he gets the benefit of the expansion of this large volume of air by the heat of the explosion.

Light of the Fire Fly.

Professor S. P. Langley has been investigating the nature of light emitted by the fire fly, *Pyrophorus noctilucus*, using the spectroscope. He finds the light is substantially from the green side of the spectrum. It is of exceedingly narrow range of refrangibility, extending only from F to C, and culminating in the green, so that it contains no appreciable heat. The amount of heat yielded, as measured with Professor Langley's wonderfully delicate "boloscope," is less than one-half of one per cent of that given out with an equal amount of light from the candle and other common combustible illuminants.

That the light produced by the fire fly is a chemical product would seem to be indicated by the fact, established by Professor Langley, that it decreased by the processes which check combustion and increased by the opposite, that nitrogen quenches it and oxygen stimulates it, while the product of the operation, whatever it may prove to be, is apparently carbon dioxide. It may prove, however, so far as can be judged at present, that these effects are simply those of variation of the vital powers, and a resulting variation in intensity of the light.

Eye Magnet.

In machine shops it is a frequent occurrence that particles of metal penetrate in the skin and eyes. Messrs. Frister & Rossman have, according to *Revue Industrielle*, constructed a magnet for the special purpose of extracting such particles. It is horseshoe-shaped, polished, and nickel-plated; the two branches are rounded off and end in a point only a few millimeters thick. Its attraction for iron extends for several millimeters.

DOCTOR FLINT is quoted as saying: "I have never known a dyspeptic to recover vigorous health who undertook to live after a strictly regulated diet, and I have never known an instance of a healthy person living according to a strictly dietetic system who did not become a dyspeptic."