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THE SCIENTIFIC AMERICAN SUPPLEMENT,

No. 480,

For the Week Ending March 14, 1885.

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LIGHT-SHIPS ACROSS THE ATLANTIC.

In a recent number of the SCIENTIFIC AMERICAN, a correspondent signing himself C. G. R. advises the establishment of a chain of light-ships across the ocean, electrically connected with the shore. This plan is good but not original, having been suggested about a year ago by a member of the Institution of Civil Engineers (English). The latter, however, confined himself strictly to the scientific aspect of the scheme; but it would not be difficult to show that from a nautical standpoint, also, it is far from impracticable. The experience with light-ships proves that a vessel, if properly constructed, may be made to ride out the fiercest storms at anchor save upon rare occasions, and the light steel cables of recent construction have been successfully used to anchor ships in the deepest water "off soundings." Let us suppose a chain of light-ships, seven in number, to be stretched across the ocean from the Grand Banks to the shores of Ireland. Then the distance between shore and ship and between the ships themselves would be about 250 miles. Each ship would ride to a mushroom anchor, which would permit it to swing to the tide without fouling its anchor. Only a small dynamo-electric machine and engine would be required to keep an arc light aglow in the tops.

The deep sea cable extending along the whole line and connecting the light-ships with the shore could be brought to the surface near each ship and buoyed, so that electrical connection could be made or broken at will. Each vessel would have permanent moorings; the anchor cable being made fast to a buoy and not to the light-ship itself, so that, in case of peculiarly unfavorable conditions of weather, such as a hurricane, for instance, a light-ship could slip her cables and run before it or be hove to under a small trysail, or permitted to drift to leeward under a floating anchor, regaining her moorings when opportunity offered.

The advantages of such a system of light-ships must be apparent even to the most pronounced landsman. The stations being only 250 miles apart, no ship upon the high-seas, if following the alignment of the light-ship, need at any time be more than 125 miles from telegraphic communication with the shore or from succor in case of mishap. This would be only an eight hours' run, and even much less for a first-class steamer, and about twelve hours' run for a sailing vessel with a fair wind.

The position of each light ship would, of course, be accurately determined and laid down on the U. S. Coast Survey and Admiralty charts, and the masters of sailing ships that had been beaten about in storms and thick weather would be enabled to get their latitude and longitude without relying upon the chance of speaking a steamer. It would only be necessary to read the number of the nearest light-ship by the aid of their glasses, and a reference to the chart would then give them their true position, whence they could take a new and correct departure. The progress of the great Atlantic liners could be telegraphed daily to both America and Europe, if kept within sight of the light-ship, and that painful suspense which now attends the breaking of a shaft or rudder would rarely, if ever, be experienced.

Dispatches, if urgent, could be sent to ships in mid-ocean. In the case of fast going steamers, it would, of course, be impracticable to stop for these, nor would such a course be necessary, because by means of what is known as the "wig-wag" system of signaling ordinary messages could be rapidly exchanged between a light ship and a passenger steamer. This "wig-wag" system is based upon the principle of the Morse telegraphic alphabet, the dots and dashes of the latter being represented by waving a flag to the right and left by day and passing a white light to the right and left of a red at night.

Freighters and ocean tramps, instead of roaming over the seas inquiring of vessel after vessel where the best freights were being paid, could receive advices in mid-ocean from their owners or agents as to the most advantageous market.

MAKING A TUBE.

Straight tubes of sheet metals of all diameters from one-eighth of an inch up, of oval, and square, and octagon, as well as of cylindrical cross section, are rapidly produced in sheet metal manufactories either drawn in presses without seam, or formed in dies and rapidly soldered along the seam. These are sold at hardware and tool stores at a price much lower than a single one could be made by hand. But there are occasions when the machinist requires a tube of some non-standard diameter, or he needs a tapering pipe that cannot be readily found in stock. In order to form one a mandrel of the proper inside dimensions must be prepared—an ordinary iron mandrel. Cut a slip of paper about half an inch wide to meet around the mandrel, with an addition to its length of the thickness of the sheet metal to be used. The length of this paper slip is the width of the sheet metal to be cut to form the tube. If the tube is to be a tapering one, cut two slips, one for each end, place them the proper distance apart on the sheet metal to form the length of the tube, and draw lines from ends to ends.

After cutting out the metal form, bevel with a file the inner edges of the plate, so that when rolled up the outer edges will meet, while the inner edges do not quite come together, but have a V-shaped channel. The tube may be formed by laying the sheet over a V-shape score in a block of wood, placing the mandrel on its center, and beating on the mandrel with a mallet or a soft metal hammer; and the edges of the sheet may be made to meet by lightly coaxing with the copper or Babbitt metal hammer. When the edges meet, secure them with loops of fine wire, twisting the ends. See that the seam of the tube is clean, and then spread on it, inside, a paste made of borax calcined on a plate of iron or a pan of iron over the fire and mixed with water. Sprinkle on the seam inside some spelter solder, or the wire solder that is found at hardware stores; heat over a brisk flame fire, preferably of charcoal, and the solder will melt and make a good joint. Cool the completed tube, remove the binding wires, immerse the tube in a bath of one part, volume, of sulphuric acid to four parts water for a few minutes; wash in clean water, and scour with sand or emery.

HORACE LORD.

Horace Lord, the superintendent of Colt's Works, Hartford, Conn., died in that city Feb. 28, after a brief illness. Perhaps as much of the wonderful success of these celebrated works was due to him as to any other person excepting Col. Colt himself; for Mr. Lord was not only a practical mechanic, but also the inventor of a number of machines and of improvements in the methods of production of the famous revolving chamber pistols that are so intimately associated with the name of Col. Samuel Colt. Mr. Lord was connected with Col. Colt from the first beginning of the pistol business in 1851 as assistant superintendent, and subsequently as the chief superintendent. Although Mr. Lord was a prominent and public-spirited citizen of Hartford, and one of the most noted among those connected with Masonry and Temperance, a strong Union man, and a stanch abolitionist, he will be remembered by the public generally for his connection with the great Colt's works, and by his friends as a kind hearted, generous, genial man. He was in his seventieth year at the time of his death, but his wonderful vitality gave him the appearance of a much younger man.

HOW SHALL THE ERIE CANAL BE IMPROVED?

Whether or no the Erie Canal should be deepened and widened is one of those questions on both sides of which much may be said, and which not even the most experienced are able to decide with anything like certainty. There can be no doubt that the deepening of the water and the enlargement of the locks would be followed by an increase in the business of the canal; but would this increase of business compensate for the extraordinary outlay required?

Less than a fifth of the freight between Buffalo and New York now takes to the canal, whereas thirty years ago it carried nearly nine-tenths. Is this because the canal has been permitted to remain unimproved, or is it because the growing commerce demands greater facilities and a quicker mode of transit? The whole question was under discussion at two recent meetings of the American Society of Civil Engineers, and the fact that able and well informed men were found espousing both the one side and the other, and that no decision was finally reached, shows that it is one of more than ordinary difficulty.

The discussion was brought about through the reading of a paper on "The Radical Enlargement of the Artificial Waterway between the Lakes and the Hudson River," by State Engineer E. Sweet, M. Am. Soc. C.E. Mr. Sweet is in favor of enlarging the canal so that it can accommodate the largest vessels now navigating the lakes, and so as to even anticipate the lake vessel of the future of still greater draught. He thinks the canal should have a depth of 18 feet at least, with a width at the bottom of 100 feet. But this is by no means all that would be required to make the canal the most natural highway for that great Northwestern commerce to which, in Mr. Sweet's opinion, it would under more favorable conditions fall heir.

Mr. Sweet roughly estimates the cost of this work at $125,000,000 to $150,000,000, and its annual tonnage at from 20,000,000 to 25,000,000 tons. He believes that with the canal so improved it would be possible to bring freight to New York from Chicago in quicker time and at less cost than is now required to bring freight from Buffalo by canal. Against these radical improvements many, and it must be said some very good, reasons were urged. The large lake vessels, having a capacity of 90,000 bushels of grain, would cost in the neighborhood of $100,000 and require large crews; they would move slowly in an artificial waterway, the round trip between Lake Erie and the Hudson requiring possibly a month and sometimes more, and this would make the expense so great as to give the Welland Canal a palpable advantage. Indeed, as the cost of transfer of grain does not exceed one-quarter of a cent per bushel from lake vessels to canal boats, it is