Atlantic Wrecks for Thirty-seven Years.

We have before us a record showing the number of lives lost in crossing the Atlantic during the last thirty-seven years. In this period fifty-six fine steamers have been wrecked, and in twenty-nine instances more or less lives were lost. Nine vessels were never heard from after leaving port. These are the President in 1841, the City of Glasgow in 1854, the Pacific in 1856, the Tempest in 1857, the United Kingdom in 1868, the City of Boston in 1870, the Scanderia in 1872, the Ismailia in 1873, and the Colombo in 1877. The number of lives which were thus blotted out aggregates 1,397. Of the remaining vessels, four were burned, five sunk by collision, two by colliding with icebergs, two foundered at sea, and thirty-four were wrecked on various coasts. This is a suggestive showing, for it at once calls into contrast the relative peril incurred by dependence upon human judgment and human handiwork. Of the entire total of steamers lost, in but two cases can the disaster be attributable to a breakdown of the machinery; namely, the Anchor line steamer Hibernia, which foundered through her propeller shaft having been withdrawn from its place after the propeller had been lost; and the other the Ismailia, of the same line, which was once spoken under sail, her machinery being disabled, and was never heard of afterward. Neither has any boiler explosion occurred on an Atlantic steamer during the period mentioned. So far as the record before us is authority, the inference therefore is that the greatest loss of life is due not to lack of safe vessels, but to failure in judgment or the incompetence of those who handle them.

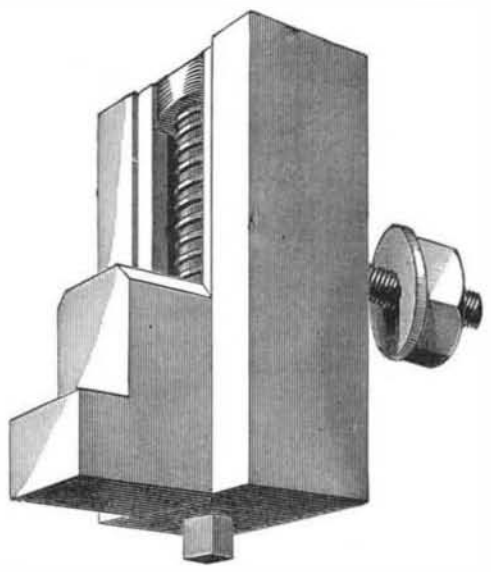
Thirty-four steamers, as above stated, have been wrecked, and an inspection of the localities where the wrecks occurred shows that several have happened in about the same vicinity. For example, the City of New York in 1861 and the Chicago in 1868 were both wrecked on Daunt's Rock, near Queenstown. No less than twelve have been destroyed on the coasts of Nova Scotia and Newfoundland. It may be asked if vessels cannot be built strong enough to withstand driving upon the rocks as in the cases of the Atlantic and the Schiller, at least for a sufficient time to enable the passengers and crew to obtain assistance or make their escape; but here the question of cost obtrudes itself, and the answer of those who have considered the subject is that vessels cannot be so constructed and yet profitably used. Taking this into account with the aggregate number of lives lost, in all 4,780, and it will be evident that the problem of reducing the dangers of the sea becomes, as we have frequently urged, one depending on the efficacy of life saving inventions. Devices which will keep large numbers of people afloat for considerable periods, devices that will keep individuals above water that can be rapidly adjusted to the person with no possibility of mistake, devices for taking lines from wrecked vessels to the shore, devices for indicating the relative positions of ships to each other, new signals for fog and night, and contrivances of that nature, all are subjects for the inventor's skill in devising better modifications and improvements.

A LARGE SUGAR MILL.

The sugar cane mill shown in the accompanying engraving is the largest which has yet been made in this country, and is of a character which leads the London *Engineer* to remark that there is reason to believe that in this class of machinery American makers will soon compete largely with English engineers. It was made by the Farrel Foundry and Machine Company, of Ansonia, Conn. It is driven by a Corliss beam engine (shown at the left of the illustration), with a cylinder 30 inches in diameter and 5 feet stroke. The cane mill rollers are 44 inches in diameter, and 90 inches long on the face. The castings for the entire mill weighed over 300 tons, the nature of the work demanding peculiarly substantial parts. The operation of the machinery may be readily understood without further detailed description.

INDEPENDENT JAW FOR LATHE CHUCKS.

We illustrate herewith an improved jaw for lathe chucks, which can be fixed in any desired position so as to hold pieces of any irregular form. It can be quickly removed from the chuck and attached to the face plates of engine and shafting lathes, drilling and boring machines, or to the platen of planers and milling machines. The manufacturers claim that the device never gets clogged with chips or dirt or the screws out of order, causing it to work with difficulty. It can quickly be removed from one lathe to another, thus saving the use of several chucks, and is further claimed to be



INDEPENDENT JAW FOR LATHE CHUCKS.

the only jaw adapted to chucks of large diameter. It is made of wrought iron or steel and case hardened. The screws are of steel. The large sizes have two or more bolts to fasten them to the chuck. For further information address the American Twist Drill Co., Woonsocket, R. I.

Telephone Notes.

Mr. W. H. Preece considers that the telephone may be employed both as a source of a new kind of current and as a detecter of currents which are incapable of influencing the galvanometer.

It shows that the form and duration of Faraday's magneto-electric currents are dependent on the rate and duration of motion of the lines of force producing them, and that the currents caused by the alteration of a magnetic field vary in strength with the rate of alteration of that field; and further, that the infinitely small and possibly only molecular movement of the iron plate is sufficient to occasion the requisite motion of the lines of force. Mr. Preece has also pointed out that the telephone explodes the notion that iron takes time to be magnetized and demagnetized.

The best way to adjust the magnet, that is, as near as possible to the plate without touching, is to sound the vowel sound *ah* or *o* clearly and loudly; a jar is heard when the parts are too near together.

Mr. Preece has found that, if the telephone wire be inclosed in a conducting sheath, which is in connection with the earth, all effects of electric induction are avoided; and further, if the sheath be of iron, magnetic induction also is avoided and the telephone works perfectly.

The leakage on pole lines is fatal to the use of the telephone in wet weather for distances beyond five miles.

Hon. Rollo Russell, says *Nature*, has made some experiments, which go to prove that there is no need to insulate the wires connecting a pair of telephones, at least when used for short distances. No. 18 uncovered copper wire was laid along grass and trees 418 yards, the two lines being kept well apart, and articulation was very well heard. The same wire was buried for three yards in wet clay, when telephones 20 yards apart gave good results, showing that bare wires may be taken under roads, etc., without diminution of the audible effect. Conversation was heard through lines submerged in water about 40 yards and lying on the grass for 28 yards.

M. Demoget, of Nantes, calls attention to the fact that if two telephones be placed in direct communication with the two wires of a Ruhmkorff coil, so as to close the circuits of each by means of these wires, if one or the other of the telephones be spoken into, the second transmits the sounds just as if both were in direct communication with one another. Another fact noted is that two telephones in double circuit may be disposed at the end of a line, and if both be simultaneously spoken into, two voices are heard in a single telephone at the other end of the line. M. Demoget therefore suggests the placing of two or three telephones of different pitch in a chamber forming a resonator, in order to obtain more intense and more distinct sounds.

Modern Marine Engine Economy.

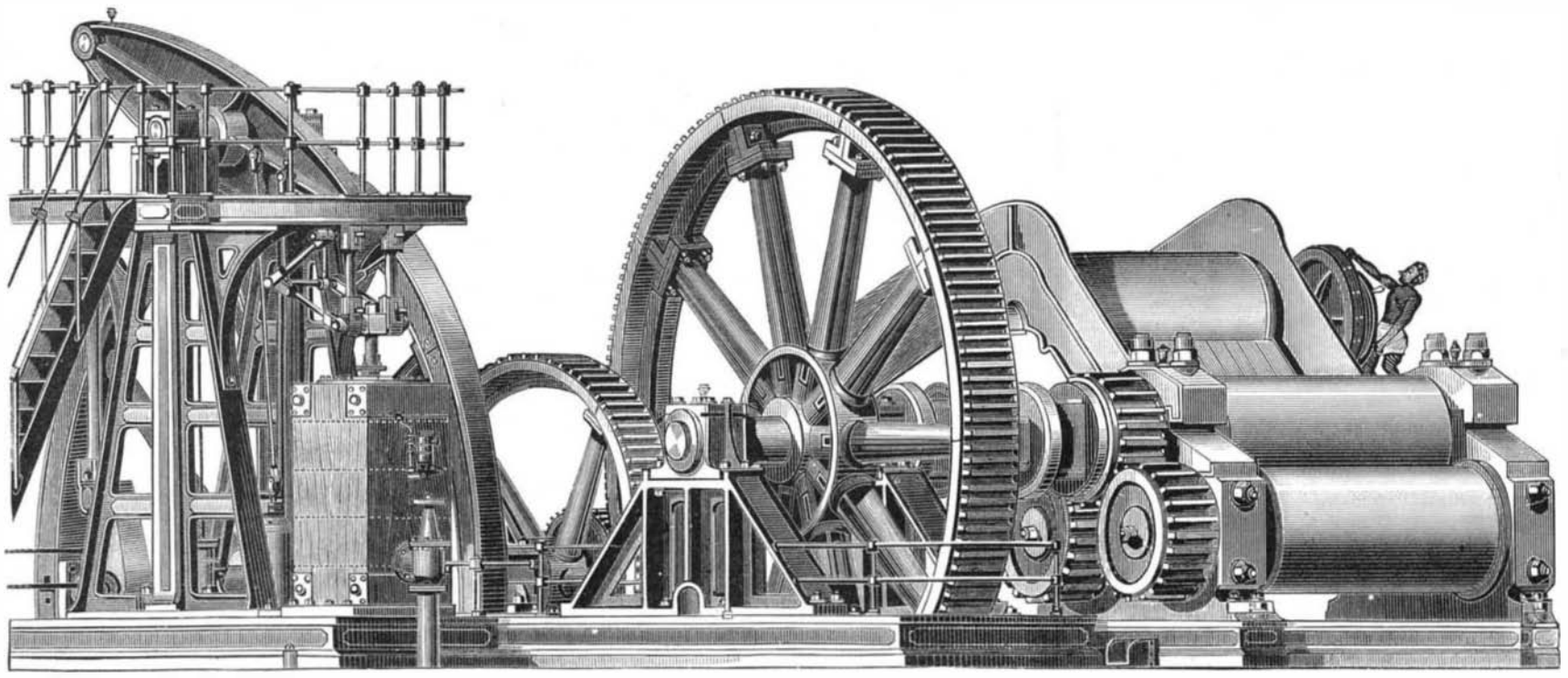
One of the most suggestive illustrations that can be adduced as showing the advances made within the last forty years in marine engine economy is derivable from an examination of data calculated by Mr. Arthur J. Maginnis from recorded averages of Atlantic steamships—and more especially of those of the Cunard paddlewheel steamer "Britannia" in 1840, and the White Star screw steamer "Britannic" in 1877. Of the first vessel the average duration of passage was 14 days and 8 hours, and the consumption of fuel 544 tons, the daily consumption thus being 38 tons.

Assuming the average cargo at 225 tons, this gives 48·35 cwt. of coal per ton of cargo; and the average speed in knots per hour being 8·3, the consumption per knot was 3·8 cwt. The indicated horse power was 740, and consumption per horse power, 4·7 cwt. The Britannia displaced but 2,050 tons, and this must be taken into account in comparing her with the Britannic, whose displacement is more than four times as great, or 8,500 tons. That vessel, in 1877, showed an average passage of 7 days 10 hours and 53 minutes, an average daily consumption of fuel of 100 tons, or total consumption of 745 tons. Her cargo is 3,350 tons; consumption of fuel per ton of cargo, 4·45 cwt.; average speed, 15·6 knots; consumption per knot, 5·3 cwt.; indicated horse power, 4,920; consumption per horse power, 1·9 cwt.

In other words, we are now enabled to transport 15 times as much freight across the ocean in one half the time at an expenditure of less than one and a half times as much coal as in 1840.

Ocean Phenomena.

Mr. J. J. Wild, in his new book on the ocean, based on the data obtained during the Challenger Expedition, states that in the beds of the Atlantic and Pacific there are immense valleys reaching a depth of 17,280 feet below the surface. In the Pacific, south of Asia and around Australia, the depth is 11,500 feet, and near Japan it attains 22,400 feet. The temperature of the sea depends upon the latitude, currents, and the season of the year. If no perturbing cause existed there would be isothermal lines of ocean temperature parallel to the equator. But warm currents travel from the tropics to the poles, and inversely cold currents move from poles to tropics and break up all uniformity. At the equator the average surface temperature is 80·6° Fah.



SUGAR CANE CRUSHING MACHINERY.