

and then back, the reverse of its movements in the first half of the revolution. But this would be readily inferred without special notice.

The exemplifications given in my first communication were all on the supposition that the pendulum should commence oscillating in the meridional plane. The same phenomena would be exhibited if the original plane of oscillation should be in any other point of the compass, as is readily perceived by considering that the same conditions continue, with the simple variation of the original direction of the generating planes in the sphere, while their relative directions remain the same. The angles which the tangents of the great circles, in which the two generating planes cut the earth, make with the respective axes of those planes, are the variables dependent on the direction of the original plane of oscillation. And these angles are invariably the same with both generating planes, whatever their original direction. When the original direction is north and south, these angles are nothing; when east and west, 90° , as the direction varies from the meridional.

The slight irregularity arising from the spheroidity of the earth, or any other incidental disturbance, was not there considered, being foreign from the object proposed in the exposition.

Washington, D. C., Nov. 25, 1851.

*Description of a New Chain, invented by M. Sisco.**

Experiments have been made at Woolwich Dockyard with a new description of chains, submitted by M. Sisco, a Frenchman. The new chains are made of common hoop-iron of the breadth required, and wound on a reel by machinery into an oval shape, and to the same breadth as the outer surface, which is rounded off after the whole has been brazed in passing through a furnace of molten metal. The usual test of an iron chain for naval service of two inches in diameter is 70 tons strain, but many links break with the application of far less power, and yet the other parts of the chain are found qualified to pass the required ordeal. M. Sisco's chain of two inches broad and two inches thick, with stays in the centre of each of the two links, was placed in the testing-frame, attached to a testing-chain of $2\frac{1}{2}$ inches in diameter, and on the hydraulic power being applied one of the links was lengthened $\frac{5}{8}$ -inch and the other $\frac{1}{2}$ -inch when it reached a strain of 110 tons, and the $2\frac{1}{2}$ -inch testing-chain broke off in two places when the strain reached 114 tons. The hoop-iron chain had some openings in one of the links, which had been imperfectly brazed, but it did not appear to have been otherwise defective. One link of the same dimensions, 2 inches thick and 2 inches broad, was afterwards placed in the testing-frame, and when a strain of 70 tons was applied to it had lengthened $\frac{1}{2}$ -inch; with 80 tons, $\frac{1}{3}$ -inch; with 100 tons, $\frac{3}{8}$ -inch; with 110 tons, $\frac{1}{4}$ -inch; with 115 tons, $\frac{5}{8}$ -inch; and when it resisted 120 tons strain it was considered advisable not to continue the strain, as it was so great as to loosen the stone frame on which the machine rested, and liable to damage other parts of the powerful frame of the machine. The strain applied on this occasion was one ton more than had ever been previously

* From the London Architect for November, 1851.

applied, and the hoop-chain was only slightly opened on one side. When inquiries were made as to the price at which the hoop chains could be supplied, it was stated that they would not cost more per cwt. than the common chains, although their holding powers were so much greater in proportion.

On the Passage of the Steamer Atlantic from New York to Liverpool. By

JOHN HAMPSON, C. E.*

The following account of the number of revolutions made by the engines of the United States Mail Steamer *Atlantic*, on her August trip, from New York to Liverpool, and calculation of the slip of the wheels, may be acceptable to your readers.

Whole number of revolutions reported by the engineer,	217,681
Distance from port to port,	3050 miles.
Effective diameter of wheels, reckoning from centre to centre of float, floats 27 inches deep,	33·33 feet.
Hence $\frac{33\cdot33 \times 3\cdot141 \times 217,681}{6116}$	3728·26 miles.
Distance presumed to have been run (at the least,)	3050

Miles slip 678·26

equal to $18\frac{18}{100}$ per cent.

London, Sept. 29, 1851.

FRANKLIN INSTITUTE.

Proceedings of the Stated Monthly Meeting, November 20, 1851.

S. V. Merrick, President, in the chair.

John F. Frazer, Treasurer.

A. S. Roberts, Recording Secretary, P. T.

The minutes of the last meeting were read and approved.

Donations were received from The Chemical Society, London; B. H. Latrobe, Esq., Baltimore, Maryland; Thos. Ewbank, Esq., and Gen. T. Lawson, Surgeon Gen. U. S. Army, Washington, D. C.; J. R. Tyson, H. C. Baird, Blanchard & Lea, John F. Frazer, Horatio Stephens, Wm. Firmstone, and Edward Miller, Philadelphia.

The Periodicals received in exchange for the Journal of the Institute were laid on the table.

The Treasurer's statement of the receipts and payments for the month of October was read.

The Board of Managers and Standing Committees reported their minutes.

The Committee on Exhibitions presented their report on the late Exhibition.

Resignations of membership in the Institute (53) were read and accepted.

* From the London Artizan for October, 1851.