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JOHN IRWIN,
29th, 1840-34-17

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JOHN WILSON,
29th, 1840-32

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The Standard.

OR FRONTIER GAZETTE.

Volume 7.

SAINT ANDREWS, NEW BRUNSWICK, THURSDAY MORNING, DECEMBER 31, 1840.

Number 52.

ERICSSON'S PROPELLER COMPARED WITH SMITH'S SCREW.

An Archimedean screw, properly speaking is a single thread winding spirally around a shaft as a centre, and terminating at any desired angle at its circumference. It has been familiarly described as resembling a patent corkscrew. Used as a propeller, an inclination of forty-five degrees, with its axis, must be the best, as one revolution will then give the same progressive as if it does lateral motion—that is to say, 3.14159 times its diameter. Constructed with the thread terminating at this angle (being 5 ft. 9 in. in diam. ter.) its length should be 18 feet: such a screw, however, applied to the *dead wood* of a ship would be inconvenient, hence the necessity of reducing it. The angle of the thread must, of course, be reduced in proportion, and the speed of the propeller increased, 8 feet is the length of the Archimedean screw *a*, with one turn of the thread; but the two threaded screw *b* is the one now in use (even 8 feet being rather inconvenient to be exposed to the surge of a ship in a heavy sea.) The screw *b*, having two half turns of the thread at the same angle with the one turn of *a*, will have the same progressive motion, say 8 feet for each revolution (*c*, is an end view.) The speed of her engine, on the first day of trial here, was 27 revolutions in a minute, which, multiplied by the accelerated motion given by a series of cog wheels, 5 1/3, will give 144 revolutions of the screw. 144 multiplied by 8, the progressive motion of each revolution, gives 1,152 feet in a minute, equal to 13 miles and 9-100ths in the hour.

Her speed, on this occasion, was ascertained to be 9 knots (by log.) 10 miles, I understand, is claimed. Let it be granted, although she never performed it on that day, what has become of the 3 and 1-10th miles unaccounted for?

There are several obvious causes of loss of power in the Archimedean screw. First, every particle of water, impinged by the forward section must remain in contact until it passes off at the after part of the screw. In a this distance would be 25 feet at the circumference and 8 feet at the axis, the mean would be 16 1/2 feet. In the present adaptation of the two threaded screw *b*, the mean distance will be 8 1/4. During this contact, a revolving motion must be given to the water, thereby decreasing its effect as a resisting medium. Second, the power applied at the centre and for some distance outwards must be very inefficient: the angle of the thread with the axis being so acute, it will have little other effect than giving revolving motion to the water.

Third, the necessary rapidity of the motion of the screw must cause great friction, its speed being 144 revolutions. Its circumference must, consequently, move at the rate of 3,600 feet, more than half a mile in a minute, the lateral friction of which must be no small item in retardation.

Ericsson's propeller (fig. d side view, *c* end view) may be described, when of corresponding dimensions, as a section of a six-threaded screw. The threads, instead of starting from the centre, are attached to a hollow cylinder or hoop of wrought iron, which is firmly secured to the axis by three radiating arms. To this cylinder *d* hoop six planes are strongly riveted on the outer surface, and three of smaller dimensions on the inner, between the radiating arms. They are all placed at such an angle as will give, with 6 feet diameter, 16 feet progressive motion for each revolution. The dimensions would be 6 feet in diameter, and but 20 inches in length; its application to a ship or steamer, already built, would, therefore, be extremely simple.

It will be seen, that, in this propeller, the objections stated against the continuous screw are greatly obviated. The water impinged is more quickly parted with, and therefore affords, during the time of contact, a more perfect resistance. The power being applied only where it is most efficient, near the circumference, little comparative motion is given to the water; and the required speed being so much reduced by the more advantageous angle at which the threads of the screw can be placed, the friction of their passage through the water will, likewise, be reduced in the ratio of the squares of their relative velocities.

Let us now perform the actual performance of Ericsson's Propeller, in the small iron boat the Robert F. Stockton, with that of the screw, in its present improved modification in the Archimedes.

By reference to your files you will find the following, copied, I believe, from the *Mechanic's Magazine*:

"We are now gratified in giving the result of some of her first experiments on the Thames. On Saturday week she was on the river with a party of about thirty gentlemen, invited to witness her performance, all of whom were quite astonished at her speed, nine miles being run, with the tide, in 65 minutes. Suppose 2 1/2 miles allowance for the tide, there would be left full 12 miles an hour for the speed of the boat. But her triumphant experiment was made on Wednesday last, when she was put to the task she was designed for, showing her power for towing

No. 1. Neptune, 15 feet beam, 4 feet 6 inches draught.

2. Joseph, 15 feet 7 inches beam, 4 feet 6 inches draught.

3. Ugin, 15 feet, 4 inches beam, 4 feet draught.

4. Mary, 15 feet 12 inches beam, 4 feet 6 inches draught.

Four loaded coal barges, of the dimensions and draught as described above, were made fast to the Robert F. Stockton, making in all 50 feet 1 inch beam, with square ends and upright sides, besides the steamer. All ridiculed the idea of attempting, with so small a boat, to tow such an immense, ugly mass, and the coal-cavers swore they would "eat her if she moved them at all." In less than one minute from the time of the starting of the engine, it was at the speed of 49 revolutions in a minute, and actually towed the whole 1 measured mile in 11 minutes, the water being perfectly still. The difference of speed between the propellers and the body moved being but 22 per cent., while the loss of power with wheels over the side, in the best constructed boats, running high, is allowed, both in theory and practice, to be 33 1/3.

Further experiments will doubtless be made, the results of which we shall take great pleasure in laying before the public; and in the mean time we venture to predict, that for canal and for ocean navigation, Ericsson's Propeller is destined to supersede every other application of the power of steam."

Again, I have not the means of ascertaining the dates, as I have only a slip from your paper, you give the following from the *London Times*:

Ericsson's Steam Propeller.

"It is a fact requiring no demonstration, that almost incalculable advantages would be derived from steam navigation if the present paddle-wheel were of such a nature as not to be retarded, and not to waste the steam power at sea in rough weather, or during the heeling of the vessel produced by the pressure of sails, in using that cheap auxiliary the wind. It is admitted, that the loss of power in the best constructed paddle-wheels, arising from their unequal immersion, from the angle of incidence at which the paddle strikes the surface and from the receding of the water, is about one-third. It is also a fact readily admitted, on considering the defects alluded to, that no material improvement can be effected unless that mode of applying the power is superseded by some propelling apparatus capable of acting with full efficacy when wholly under water as well as when partially immersed; in other words, a propeller which, under all circumstances, is capable of imparting an equal force to the vessel whilst subjected to sudden or gradual variations in the draft of water, whether produced by a heavy sea, pressure of sails, or by increase or diminution of cargo. These conditions are fulfilled by Capt. Ericsson's Propeller, which may be briefly described as consisting of two wheels of wrought iron, formed by a series of spiral plates riveted to narrow cylinders of the same material, which are connected by radiating spiral arms to the centre. These wheels are attached to shafts (the one to which the inner wheel is fixed being hollow passing through the stern of the vessel, and revolving to opposite directions, each series of plates being so placed on the cylinders."

The results of a variety of trials prove, that great saving in time and expenditure ensue; we, therefore, anticipate important changes in steam navigation from its introduction and use.

The great power exhibited, during the early trials of this propeller, about 18 months since, induced some American canal proprietors to order an iron steamboat, with a 50 horse engine, to be fitted with the new propeller. This small iron steamer, called the Robert F. Stockton, has lately arrived in the Thames from Liverpool, and will shortly proceed to the United States: her dimensions are 70 feet in length on deck and 10 feet beam. A variety of experiments have been made in presence of several scientific and practical men, who consider the success to be perfect. Although constructed for towing purposes only, this boat has frequently gone at the rate of 12 miles an hour. As to her power as a tug, we are informed, that, on Tuesday last, January 20, she towed the American packet ship Toronto from Blackwall to the lower point of Woolwich, a distance of 3 1/4 miles, in 40 minutes, against the flood tide, then running from 2 to 2 1/2 miles; thus towing her through the water at the rate of upwards of 6 miles an hour. The Toronto is 650 tons burthen, she measures 32 feet beam, and drew at the time of trial, 16 feet 9 inches. Thus presenting a sectional area of more than 400 square feet. Now, the fact of this body having been moved at a rate of upwards of six miles an hour, by a propeller, or piece of mechanism, measuring only 6 feet 4 inches in

"In some cases, this construction, with a double propeller is required. In shoal water, for instance when only half the wheel can be immersed; and also when the boat is intended to be used as a tug, to tow heavy masses at a slow speed, and great resistance is needed. The Stockton was constructed for this purpose. But, when speed only is required, a single wheel will, in all cases, be preferable, with the planes set at a mean angle of 45 degrees.

diameter, and occupying less than 3 feet, is one which, scientifically considered, is interesting in the extreme, and, in a practical or commercial point of view, is of immense importance. We understand, a company is about being formed, to apply the propeller to a ship of 1000 tons burthen, to be employed in transatlantic navigation; and, as her sailing qualities will not at all interfere with her steaming power, it is confidently anticipated, that increased safety will be ensured and her passage greatly accelerated, as a saving of, at least, one-half the fuel."

And again, from the same journal: "The experimental iron steam boat Robert F. Stockton, constructed for testing Captain Ericsson's Propeller, which we noticed some time since, being on the eve of departure for the United States, at the request of a number of scientific gentlemen who were desirous of witnessing her performance, the proprietor consented to another trial being made, and, on Saturday last, a large party was invited for this purpose. Among those present were Major-General Sir John Burgoyne, Chairman of the Board of Public Works, and Commissioner for Steam Navigation, &c. in Ireland; Major Robe, of the Royal Engineers; Mr. James Perry, of Dublin, lately concerned in canal navigation; Messrs. Vignolles, Delafield, Reid, Napier, and Thomas; several distinguished Swedish naval officers; Capt. Stockton, of the United States Navy; Mr. Ogden, Consul of the United States at Liverpool; Mr. Young, an American civil engineer, &c. Some thirty gentlemen were present, and the result of the trial gave universal satisfaction."

One of our correspondents having before described the construction of the new propeller, we will now more particularly direct attention to the effect produced during the trial, which appeared quite conclusive as to the success of this important improvement in steam navigation. The distance from the West India South dock to a point opposite Woolwich Church, and back, measuring 27,000 feet, was passed in 45 minutes precisely (21 minutes with, and 24 against the tide,) the boat towing at the time a heavy city barge on the one side, a large wherry on the other, and another wherry astern. The speed of the engine being repeatedly timed by one of the gentlemen present, Mr. Young, an intelligent American engineer, it was found to average 66 revolutions per minute, or 2,970 during the 45 minutes. The inventor demonstrated, by accurate working drawings, that the spiral planes of the propeller are set at such an angle that, had the resistance of the water been perfect, the progress of the boat could only have been 13 1/2-10ths feet at each revolution, or 29,204 feet during the time, instead of 27,000 feet actually performed, thus showing a loss of less than 6 per cent. Respecting the engines for working the propeller, it was observed, that they may be made much stronger and more compact than ordinary marine engines, in consequence of the power being applied directly to the shaft which works very near the bottom; this, for sea-going vessels, will be very important, and their original cost must be considerably reduced, as all the paraphernalia of shafts, wheels, wheel-guards, &c. will be dispensed with. We were struck with the great regularity of the motion, not the slightest jar being perceptible. The engines consist of two cylinders 16 inches in diameter, with 18 inches stroke, and are worked by steam of a pressure varying from 35lb to 55lb to the square inch; their construction is extremely simple, and evinces a knowledge of steam machinery in the inventor which is calculated to give additional confidence in the success of his propeller in all the varieties of its application for the canal, river, or ocean navigation."

It will be seen, that, in her first experiment, towing four heavy laden coal barges at the rate of 5 1/2 miles the hour, the difference of speed between her propeller and the mass moved was only 22 per cent. Her ordinary speed, running light, was proved, to the satisfaction of a large party of scientific gentlemen who witnessed her performance, to be between eleven and twelve miles an hour. In her second experiment she towed the packet-ship Toronto upwards of six miles an hour. The speed of her engines is not given in this trial; but the loss must, necessarily, have been less than in the first. But, in the third, all the data are given by which it may be accurately estimated. She had a heavy city barge, in which thirty persons might sit comfortably under a standing awning, lashed on one side, a large wherry on the other, and another wherry towing astern, with these obstructions she ran, by measured distances, upwards of 9 miles an hour, through the water, independent of tide, and her loss of power was less than 6 per cent. The revolutions of her propeller, it will be seen, were 66 in a minute, and her progressive motion, (supposing a perfect resistance) could only have been 13 1/2-10ths feet.

The loss, in well constructed side wheels, is admitted to be 33 1/2 per cent.

The loss in the Archimedes screw, as proved here, 25 "

The loss of Ericsson's propeller, towing at the rate of 5 1/2 miles the hour, 22 "

Ditto, running light, less than 6 "

These are not matters of opinion; they are demonstrated facts.

POETRY.

From the Limerick Chronicle
THE SONG OF THE RIVER.
DEDICATED BY PERMISSION OF THE VERY
REV. THEOBALD MATTHEW.

I spring from the rocks, from the mountain side,
Sparkling pure and bright;
And I gather strength, as I rapidly glide
From my birth-place into light.

Richness I bear to land and tree,
Beauty to hill and dale;
Beast and bird delight in me,
Drink and are strong and hale.

Fresh are the flowers that deck my banks,
The sod is greenest there;
And the warbling wing'd one sing their thanks,
As they drink of me ev'ry where.

The traveller on burning sands,
The wanderer on the sea,
Gasping for water, clasp their hands,
And wildly pray for me.

I am the only drink was given
To man when pure and free;
Return then to the streams of Heaven,
You're safe when you drink of me.

A New Drink.—"Mr. Guzzlefunk, I have discovered a new drink for you. Suppose you try a little."

"Well, I don't care if I do [drinks]. It hasn't got a very bad taste to it; and if my memory serves me right, it is not what they call water. I recollect drinking some of the stuff when I was a lad."

Rules for Determining the Temperature of a Country.—The fact that a degree of latitude is equal to a degree of Fahrenheit, and that 400 feet of elevation is equal, also, to a degree of Fahrenheit, is original and curious, and will go far to assist us in determining the climate of any country.—*Amer. Quart. Rev.*

March of Refinement.—Small potatoes are now beautifully designated as "*Juvenile Vegetables*."

Bursting of Stoves.—One of our distinguished chemists recently informed us that on one occasion, some time since, a large cannon stove in his laboratory had been partly filled with wet or damp anthracite coal, placed on other coal well ignited and the whole, in order to prevent too great a fire, was then covered with ashes. It was then left to increase by itself, without any further attention. Our informant, an hour or so after, being in a distant apartment, heard a tremendous explosion as of a heavy cannon, accompanied with a roar quite astounding. On hastening to the room whence the sound proceeded, he found the large cannon stove blown all to pieces, and the pipe split asunder to the ceiling. The cause of this phenomenon was probably, that the heated air ascended in large quantities throughout the ashes, before the intense blaze formed by the increased ignition of anthracite touched it—and, when it did, the explosion occurred.

EUROPEAN NEWS.

From the Brighton Guardian Nov. 25.

BIRTH OF A PRINCESS ROYAL.

The great event of the week is the delivery of HER MAJESTY on Saturday a few minutes before two o'clock of a female infant who will henceforth be the Princess Royal of England. Her Majesty and her infant are both doing well. The following are the particulars as published in an Extraordinary Gazette on Saturday, and in the London Sunday papers.

On Friday Her Majesty and Prince Albert walked in the garden of the Palace, and again did her Majesty take her seat at the dinner-table, and continued apparently in her usual health till 11 o'clock when she retired to rest no suspicion being then entertained of the near approach of those sufferings, which providentially have terminated in a manner so satisfactory to every branch of her august family as well as to the delight of her loyal and devoted subjects. At 2 o'clock on Saturday morning the first symptoms of uneasiness were indicated; and at four her Majesty with great firmness directed that her attendants should be summoned. Among these was Mrs. Lily, formerly nurse to the Duchess of Sutherland and whose experience at once forewarned her of the propriety of immediately summoning her Majesty's professional advisers. Sir J. Clarke, Dr. Looock, Mr. R. Ferguson, and Mr. R. Blagden, were instantly sent for and were quickly on the spot. No doubt now existed that her Majesty was in labour, although certainly some days sooner than had been anticipated as the impression was that she would have remained convalescent till early in December. Special messengers were despatched to her Royal Highness the Duchess of Kent

the Archbishop of Canterbury, the Bishop of London, the Lord Chancellor, Lord Melbourne, Lord Palmerston, Lord Errol, Lord Albemarle, Lord John Russell, and other Privy Counsellors, whose constitutional duty it was to be present at the throne. A messenger was also despatched to his Royal Highness the Duke of Sussex. Her Majesty's august parent was early at the Palace; and in the course of the morning was followed by the Archbishop of Canterbury, the Bishop of London, and the other noblemen whose names we have mentioned. His Royal Highness the Duke of Sussex, it is stated, was unable to attend from indisposition. The Earl of Albemarle having to come from the stud-house at Hampton court did not arrive till late in the day, but previous to the birth of the infant, which the medical attendants announced was in favorable progress. In her Majesty's chamber were the Duchess of Kent, Prince Albert, and the medical men, with Mrs. Lily and some of the ladies of the bed-chamber; while, in an adjoining apartment, the door of which was open, were the other distinguished individuals mentioned. As the day advanced the Palace was kept in perfect quietness, while all noise from without, from the passing of bands or otherwise, was interdicted. From those who had the best means of information, we learn that her Majesty evinced a firmness and composure almost incredible,—at intervals exhibiting a cheerfulness and patient submission to her sufferings in all respects consistent with the well-known attributes of her character. The interesting moment which was to give to these realms an heir to the throne at last arrived; and precisely at ten minutes before two o'clock Mrs. Lily entered the room where the Privy Counsellors were assembled with the "Young Stranger," a beautiful, plump, and healthy Princess, wrapped in flannel, in her arms. She was attended by Sir James Clarke who announced the fact of its being a female.—Her Royal Highness was for a moment laid upon the table for the observation of the assembled authorities; but the loud tones in which she indicated her displeasure at such an exposure, while they proved the soundness of her lungs and the maturity of her frame rendered it advisable that she should be returned to her chamber to receive her first attire. His Royal Highness P. Albert having received the congratulations of all present conveyed the gratifying intelligence that her Majesty was in all respects as well as could be expected; and "the officials" retired to spread the happy news throughout the metropolis, and to prepare to meet in Whitehall, whither the P. Council were forthwith summoned to meet at four o'clock, to give the usual direction for announcing to the nation, as well as to foreign states, an event of such deep and gratifying importance. Messengers were immediately dispatched to every branch of the royal family in town; and soon after three o'clock the following bulletin was exhibited at the principal entrance of the Palace:—

"Buckingham Palace, Nov. 21, 1840.

"The Queen was safely delivered of a Princess this afternoon at ten minutes before two o'clock.—Her Majesty and the Royal Infant are doing well.

(Signed,) "JAMES CLARKE, M. D.
"CHARLES LOOOCK, M. D.
"ROBERT FERGUSON.
"R. BLADGEN."

At four o'clock the Privy Council assembled at Whitehall, and was attended by his Royal Highness Prince Albert. The usual constitutional forms were observed, and under the provisions of the act of last session, his Royal Highness Prince Albert assumed his office of Regent until Her Majesty's convalescence shall have been declared. A: the intelligence with all possible despatch, not only to the Foreign Courts, but to all parts of the kingdom. The Tower guns were fired; and at the Privy Council it was ordered that a form of thanksgiving for the Queen's safe delivery of a Princess should be prepared by the Archbishop of Canterbury to be read in all the chapels throughout the kingdom on Sunday, the 29th inst. An Extraordinary Gazette was also published in the course of the evening.

The Succession.—Some doubts having, as we hear, been expressed in various companies upon this subject, we borrow the following from Monday's Sun. "The male child whatever be his age, takes precedence of the female. Thus Edward V. succeeded to the Crown in preference to his elder sister Elizabeth—and Edward VI. succeeded Henry VII. in preference to Mary who was 21 years older. The birth therefore of the Princess Royal only establishes the succession in a direct line, and the fulfilment of a nation's hopes, shuts out the King of Hanover; but it does not thence follow that Her Royal Highness will succeed to the throne of Great Britain. The birth of a prince would set her claims aside.

Prince Esterhazy, Ambassador extraordinary and Plenipotentiary from the Emperor of Austria, had audience of the Queen at Buckingham Palace, on Tuesday last, upon his return from leave of absence.