SCIENTIFIC AMERICAN

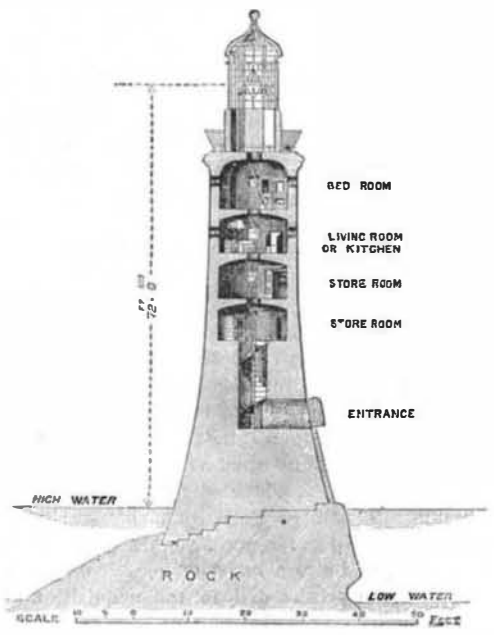
[Entered at the Post Office of New York, N. Y., as Second Class Matter.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION. ART. SCIENCE. MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XLVI.—No. 25. [NEW SERIES.] NEW YORK, JUNE 24, 1882. [$3.20 per Annum. [POSTAGE PREPAID.]

INAUGURATION OF THE NEW EDDYSTONE LIGHTHOUSE.

The first Eddystone Lighthouse was built by Henry Winstanley, in 1696. It was constructed of wood and stone, and was carried away, together with the architect and keepers, by a violent storm in November, 1703. A second, of similar construction, was built in 1708, by John Rudyard, a silk mercer, of London, and this was burnt down in 1755. The famous building by Smeaton succeeded this, and stood for over a century on the famous reef. In 1877 it was discovered that the rocky foundation had been undermined by the waves, and that, although the tower itself was sound, the portion of the reef upon which it rested had become insecure. The construction of a new lighthouse had therefore become imperatively necessary; and its cornerstone was laid by the Duke of Edinburgh, August 19, 1879.



SECTION OF THE OLD TOWER.

The new tower is from designs by Mr. James N. Douglass, chief engineer to the Trinity Board. The building has been entirely carried out under the personal superintendence of Mr. Thomas Edmond, the resident engineer, with Mr. W. T. Douglass as his assistant. It is entirely of granite from the De Lant quarries at Wadebridge, near Padstow, in Cornwall, with the exception of seven courses, in the lower part of the tower, from Aberdeen. A solid cylinder of granite, 44½ ft. in diameter, was first built up from the rock to the height of 2½ ft. above high water. From this, as a base, the tower springs, leaving a terrace, 4½ ft. wide, all round.

Experience and observation satisfied Mr. Douglass that the shape of Smeaton's tower, of which so much had been said, was not the best that could be designed, and that, by allowing the waves to run up readily toward the summit this shape had the effect of throwing the main stress of the water upon the upper part of the tower, where it acted with enormous leverage to weaken the base. He has, therefore, placed the curved portion of the tower upon a base with vertical sides, which will not have the same tendency to produce an upward run of the waves, and has also laid the foundation in a manner somewhat different from that which Smeaton had employed. The tower is built of granite blocks, some of them 6 feet 6 inches deep, 2 feet thick, and 3 feet 10 inches on their outer circumference, and they are all without a flaw. Throughout the whole tower every stone is dovetailed, by projections and grooves, into those above, below, and on either side of it; and the interstices between the blocks have been filled up with Portland cement, which blends the whole into a mass, the joints of which are as hard as the granite itself.

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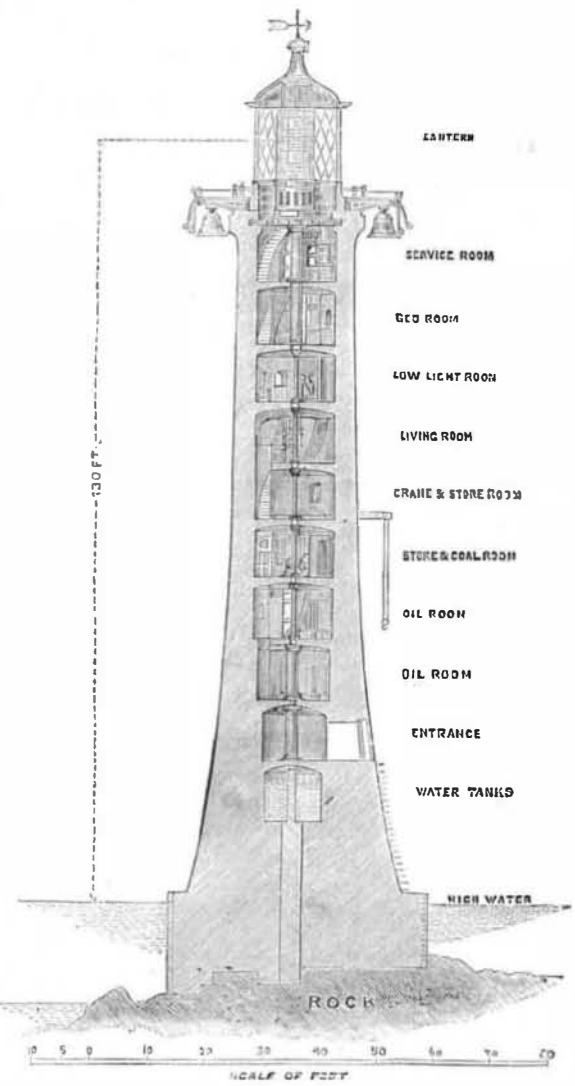

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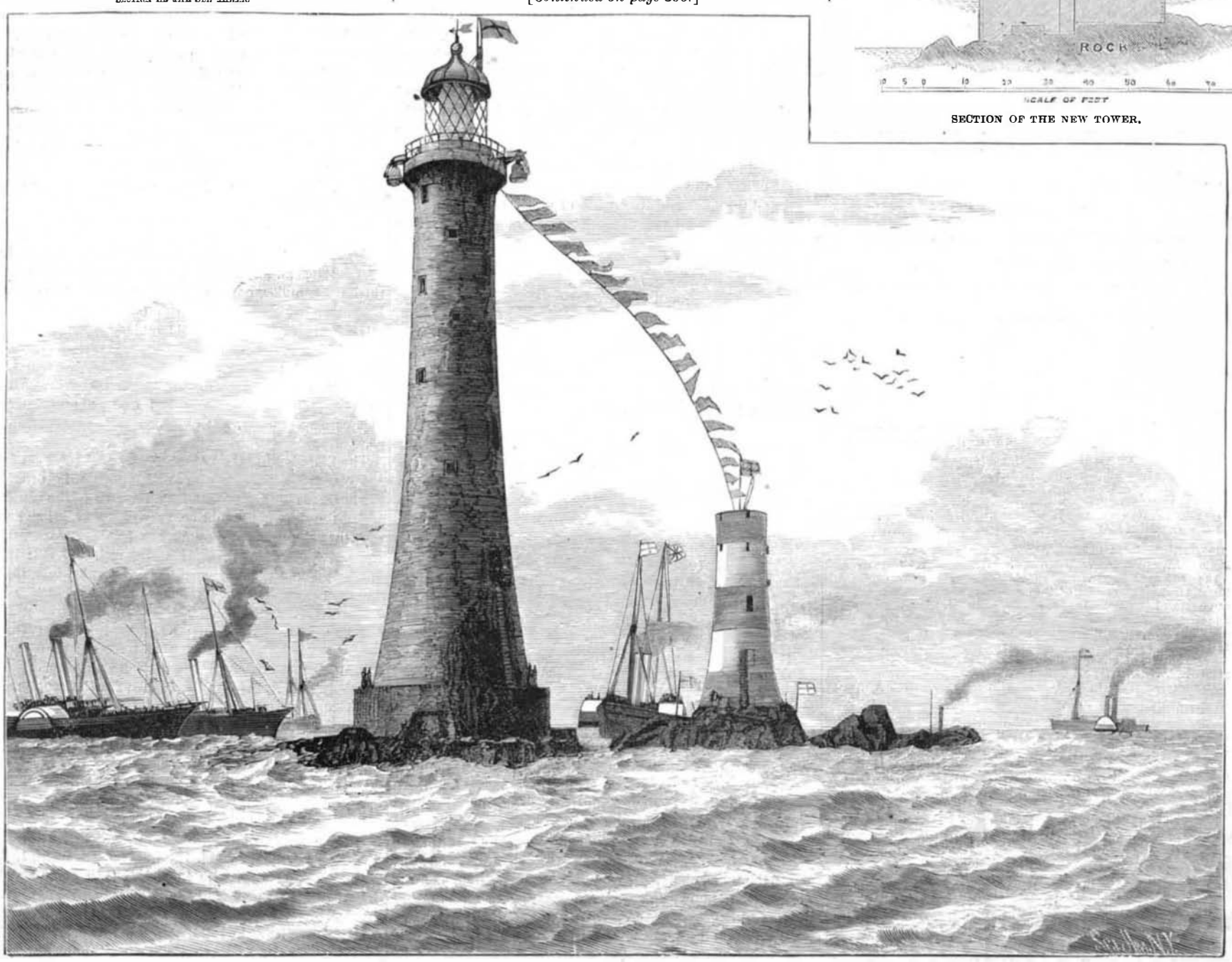

INAUGURATION OF THE NEW EDDYSTONE LIGHTHOUSE.

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(*Continued from first page.*)

The Eddystone rocks, which are of gneissic formation, consist of three reefs, the western, southern, and northern, with odd rocks dotted about irregularly. The old tower—Smeaton's, now in course of demolition—stands upon the northern extremity of the western reef. The new tower, just completed, stands at the northern extremity of the southern reef, the middle of the three. The whole group of rocks occupies nearly a square mile at low water, and stands a little to the north of a direct line between the Start Point in Devon and Lizard Point in Cornwall, being about forty miles from the former and thirty from the latter. The distance between the two towers, from center to center, is only 127 feet. The height of the focal plane of the light in the old house was 72 feet above high water, and was visible thirteen miles, while that in the new house is 133 feet, and is visible seventeen and a half miles.

On Thursday, May 18, 1882, the new lighthouse was set in operation by His Royal Highness the Duke of Edinburgh, as Master of the Trinity House Corporation, who have the charge of all lighthouses round the British coasts.

The Duke went to the Millbay Docks, where he was received on board his old ship, H.M.S. Galatea, which at once moved into the Sound. She was followed there by the Trinity yacht Siren and the Harpy, which contained the Mayor and Corporation of Plymouth. The Carron, with the Mayor and Corporation of Devonport, and the Vivid, the yacht of the Port Admiral, Sir Houston Stewart, were waiting off the pier, and with the Triton, Trusty, Perseverance, and other government steamers, joined in the procession, followed by a number of private steamers and by a whole fleet of yachts. The Galatea led the way, closely followed by the Siren, the Vivid and the Harpy coming next in order. The ships in port were dressed with flags from sunrise, and as the royal standard was hoisted salutes were fired from the citadel and men-of-war. The weather was brilliant. As the Galatea passed through the Sound two American corvettes, the Portsmouth and Saratoga, which were lying there, dressed colors and fired a royal salute. The run out occupied about an hour and a half. The coast of Devon and Cornwall, from the Prawle Point to the Dodman, was distinctly visible, and the sea was covered with craft of all sizes, from tiny fishing boats to ocean mail steamers on their way up channel. The Eddystone was reached at a quarter past eleven, and the vessels grouped themselves around the reef. This is well shown in our engraving, which is from the *Illustrated London News*. Altogether 9,000 persons were present at the Eddystone at the time the light was inaugurated; but the ceremony was not participated in by more than a select few of those on board the Galatea, with the addition of Mr. C. F. Burnard, the Mayor of Plymouth. The Duke of Edinburgh landed on the Eddystone Rock about half past eleven. A prayer was offered by the Rev. Dr. Wilkinson, the lamps were lighted, and the machinery which sets in motion the fog bell was started by the Duke of Edinburgh. Everything was found in the most perfect order. The ceremony over, cheers were raised by the party at the lighthouse, and taken up again and again by the occupants of the steamers which lay around. The Duke then embarked amidst another round of cheers, and the start homeward was speedily made, the Galatea and the Siren being this time the last to leave. The run back was made at full speed, after the Galatea had steamed round the American vessels in the Sound, which manned yards in honor of the visit. Millbay Pier was again reached a little after two. Here an address was presented by the Mayor and Corporation of Plymouth, and his Royal Highness drove from the pier to the Guildhall to attend a luncheon, given by the Mayor, Mr. Burnard. The magnificent hall was splendidly decorated. The company numbered over two hundred, and included the Duke of Edinburgh and elder brethren of the Trinity House, Admiral Sir Houston Stewart, and other heads of departments in Plymouth and Devonport, Commodore Luce and the officers of American vessels in the Sound, the magistrates and members of the Corporation of Plymouth, Devonport, and Stonehouse.

The Mayor, on rising to propose the health of the Duke of Edinburgh, said: "I may say that when I suggested to his Royal Highness, as I did, that we had not expected our American cousins on this occasion, and that it would be desirable to recognize their attendance, he at once expressed the pleasure it would give him to propose the toast of their healths. (Great cheering.) I have now to propose the health of the Corporation of the Trinity House, including the health of his Royal Highness, the Master." (Cheers.)

His Royal Highness, in concluding his remarks in reply, said: "I beg to thank you once more for the way in which you have drank to the health of the Trinity Brethren, and more particularly for the way in which you have associated my name with the toast. (Loud cheers.) The fact has been alluded to more than once by the speakers who have addressed this assembly, that we have among us to-day representatives of our Transatlantic cousins. I ask you to join with me and with the Brethren of Trinity House in welcoming among us Commodore Luce and the officers of the American squadron." (Loud cheers.)

Commodore Luce, was enthusiastically received, and said: "Your Highness, your Honor the Mayor, and gentlemen, I esteem it a great privilege to be present to-day to speak in the name of Americans. (Cheers.) As Americans, it is good for us to be here. (Cheers.) The very name of Plymouth recalls to mind the Pilgrim Fathers—(cheers)—and reminds us of Plymouth Rock in New England. As it has been happily expressed, the ocean does not divide but knits Old and New England. (Loud cheers.) Our traditions date from this country. (Cheers.) When my distinguished friend Admiral Sir Houston Stewart, reverted to the fact of Sir Francis Drake playing bowls upon Plymouth Hoe, just before he and Hawkins and Howard of Effingham, set out to meet and defeat the Spanish Armada, I was reminded that it was just as much the New England as the Old that was interested in that great epoch. (Cheers.) The Pilgrim Fathers and the Plymouth Rock are inseparably associated by us in America. And I would go further and ask what American there is who has not been nurtured in the English classics, and what American there is who has not had instilled in him the early English instincts of civil and religious liberty? (Cheers.) As the Old England has given light to the physical world, let us hope that it may continue to give light to the moral and religious world." (Cheers.)

Commodore W. B. Hoff, of the Portsmouth, Commander Henry C. Taylor, of the Saratoga, and Flag Lieutenant A. Ward were also present at the luncheon.

The Office of Resinous Matters in Plants.*

It has been difficult to make even a plausible conjecture of the uses of the "proper juices" of plants. In their production a large amount of nutritive material is consumed; and for the most part they are stored up irretrievably in the plant, not being reconverted into nutritive material. This gave some color to the old idea that they are excrementitious. But, besides that under normal conditions they are not excreted, why should a pine tree convert such an amount of its assimilated ternary matters into turpentine, which is merely to be excreted? Or, if it be a by-product, what useful production or beneficial end attends the production? If excrementitous, the tree should be benefited by drawing it off. But, as De Vries remarks, and as the owners of the trees very well know, the process is injurious, and if followed up is destructive. It goes almost without saying nowadays, that the turpentine is of real good to the tree, else turpentine-bearing trees would not exist. De Vries has made out a real use, which he thinks is the true function of the resiniferous matters in *Coniferæ* and in other resin-producing plants. Resinous juice is stored in the tree as *a balm for wounds*. It is stored up under tension, so that it is immediately poured out over an abraded or wounded surface; for these wounds it makes the best of dressing, promptly oxidating as it does into a resinous coating, which excludes the air and wet and other injurious influences, especially the germs or spores which instigate decay; and so the process of healing, where there is true healing or reparation, or of healthy separation of the dead from the living tissues, is favored in the highest degree. The saturation of the woody layers with resin, in the vicinity of wounds and fractures (as is seen in the light wood of our hard pines, is referred to as effectively arresting the decay which parasitic fungi set up, this "fat" wood being impervious to mycelium.

Latex or milky juice is a more complex product, of which certain portions have been shown to be nutritive; but as to the caoutchouc and the waxy matters they contain, De Vries insists that they subserve a similar office, are, in fact, a remedy—a protection against decay, a natural provision for the dressing of wounds, under which healing may most favorably proceed.—*American Journal of Science.*

DECISIONS RELATING TO PATENTS.

Supreme Court of the United States.

LEHNBEUTER *et al. vs.* HOLTHAUS *et al.*

Decided March 6, 1882.

DESIGN PATENT.—An immaterial variation of the design—such as a slight inclination backward, hardly perceptible to the eye, of the glass constituting the front of the elevated parts of a show case—does not relieve from the charge of infringement.

It is immaterial to the patentability of a design whether it is more graceful or more beautiful than older designs. It is sufficient if it is new and useful. The patent is *prima facie* evidence of both novelty and utility, and neither of these presumptions has been rebutted by the evidence.

Appeal from the Circuit Court of the United States for the Eastern District of Missouri.

Mr. Justice Woods delivered the opinion of the Court.

LICENSE.

In the case of Searls *vs.* Bouton *et al.*, United States Circuit Court, Southern District of New York, Judge Wheeler holds as follows:

The defense of non-infringement rests upon a license granted by the orator to John O. Merriam and Edwin Chamberlain "to manufacture" at their shop in Troy, New York, and no other place or places. This appears to be a personal license, not transferable, and a license to make only. Merriam and Chamberlain had a shop in Troy and constituted a firm. Merriam appears to have sold out to a new firm composed of Edwin Chamberlain and Perry D. Randall. Edwin Chamberlain has since died, and Edward Chamberlain has succeeded him in the firm of Chamberlain & Randall. Merriam appears to have ordered materials, or to have permitted Chamberlain & Randall to order them in his name, for use in making whip sockets at that shop, but he does not appear to have been engaged himself in the manufacture. Sockets made under and pursuant to the license would be free to the trade, but sockets merely dealt in by the licensees would not thereby be made free. The defendants have not made it clear that the sockets they have sold, which would otherwise be an infringement, were made under and pursuant to the license. Therefore they must be adjudged to have infringed. The extent of the infringement unlawfully done must, of course, go to the master for determination.

* By Hugo de Vries. A paper in the *Archives Néerlandaises*, vol xvii. 1882. The extract fills 24 pages 8vo.

United States Circuit Court—District of Indiana.

HAPGOOD *et al., vs.* HEWITT.

Decided March 22, 1882.

RIGHTS OF EMPLOYERS AND EMPLOYES IN PATENTS.

Gresham, J.:

Persons are not deprived of the right to their inventions while in the service of others, unless they have been hired and paid to exercise their inventive faculties for their employers.

A contract by which one person agrees to pay a sum of money for the time, labor, and skill of another for a given period gives the employer no right to an assignment of a patent that is issued to his employe for an invention made during the period of his employment.

If under such a contract of employment the employer has any right to the invention, it is a mere naked license to make and sell the patented improvement as a part of its business. This right, being a mere personal one, is not transferable, and is extinguished with the dissolution of the corporation which exercised it.

This was a suit brought by Charles H. Hapgood, James H. Hesse, and John Parker, trustees of Hapgood & Company, a defunct corporation organized under the laws of the State of Missouri, and the Hapgood Plow Company, a corporation organized under the laws of the State of Illinois, against Horace L. Hewitt. The relief sought is a decree compelling the defendant to assign to the Hapgood Plow Company as the successor of the Hapgood Company, or to the trustees of the last named company, in trust for the Hapgood Plow Company, certain letters patent which the defendant caused to be issued to him for improvements in iron sulky plows.

The bill is demurred to for want of equity. Demurrer sustained.

SMALL DYNAMO-ELECTRIC MACHINE.

In SUPPLEMENT 161, February 1, 1879, I described a small dynamo-electric machine, giving working drawings, together with all the particulars necessary to enable any machinist or amateur, whether familiar with electricity or not, to construct a working dynamo of small but practical size. This machine has been copied by a large number of the readers of the SCIENTIFIC AMERICAN, who have succeeded very well indeed; others, however, have failed. In the most of these failures of which I have been informed the cause has been evident enough, and should not have been overlooked by the builder of the machine.

One has an armature of very hard iron—a sufficient cause for failure, since the magnetization of the armature is reversed at each half revolution. Another has a wide space between the armature and field magnet. Another finds the wires of his magnet wound so that both poles are alike. Another discovers that his armature is short circuited, and another has found the same trouble in the wire of his field magnet. Still another finds that the commutator needs adjusting. Another has oiled the commutator, and there is not enough pressure on the commutator springs or brushes to press the oil out of the way, and the oil being a good insulator prevents the current from passing. Another finds fine particles of copper between the halves of the commutator; this, of course, short circuits the armature. Another has varied the sizes of the wire on the magnet and armature. Some expect the machine to work through large external resistance, and so on. In nearly every case the only possible advice has been to follow the instructions given in the SUPPLEMENT referred to.

Several inquiries relating to the kind of wire gauge used in giving the sizes of the wire, the electrical resistance of the magnet and armature, and the performance of the machine in connection with Edison's lamps having been referred to me, I will briefly give the following points:

Field magnet wire, No. 16, American wire gauge.
" " " between Nos. 17 and 18, English wire gauge.
" " " 0·055 inch diameter.
" " resistance of 1 9 ohms.
Armature wire, No. 18, American wire gauge.
" " " 19, English " "
" " diameter of 0·04 inch.
" resistance of 0·9 ohm.

The current from this machine will bring four Edison 3-candle power lamps to incandescence, and will light two of them with great brilliancy, the machine being turned by hand.

GEO. M. HOPKINS.

Fast Steamboat Time.

On Thursday, May 25, the Mary Powell made the trip up the Hudson River from New York to Rondout, 95 miles, in 4 hours and 17 minutes, beating her best previous time by 10 minutes. This is at the rate of 22⅓ miles an hour, and included the time taken in making eight landings.