On the Electro-Magnetic Motor of Fessel. By M. PLUCKER.*

It is known that Mr. Page, a physicist in North America, has recently endeavored to produce a motive power by an extended application of the force which attracts a mass of iron within an electro-magnetic helix. Th. Hankel, of Leipzig, has made the same attempt, and has established an important practical law, namely, that this force is as the square of the power of the current. M. Fessel has on his part constructed a model of a machine at my request, the value of which I am not for the moment able to appreciate in case it were made on a large scale, but which as a piece of physical apparatus explains and clears up the application of the force in question.

The model of Fessel is formed of two helices placed end to end in a horizontal position. They serve to conduct the current always in the same direction, but in such a way that it traverses alternately each of the two helices, and consequently only one at a time. In the interior of the helices is a bar of iron, which is alternately attracted from the one into the other by constantly maintaining the same polarity, and which thus executes a motion backwards and forwards. To the two extremities of the bar are fixed two slender horizontal shanks of brass, which rest upon two pulleys attached to the two extremities of the apparatus, and which thus support the whole weight of iron. One of these shanks sets a wheel in motion. A commutator is moved by an eccentric by means of a directing-rod, which is placed so as to be able to make the machine move backwards and forwards as in steam-vessels. In one of the machines the commutator has been fixed immediately to the axis.

Two couples of Grove's cells are sufficient to communicate to this apparatus a great rapidity. With six couples, the rapidity became such that it threatened to break the apparatus; and fearing this, I stopped the passage of the current.

I have just received from him the news that he has nearly completed the construction of a new apparatus, in which he has replaced the pulleys by oscillating shanks of metal rod, similar to the oscillating cylinders of the steam engines.—*Bibliothèque Universelle de Genève, December, 1851.*

For the Journal of the Franklin Institute.

Explosion of the Steamboat "Pocahontas." By A. C. JONES, Engineer.

To the Committee on Publications.

On February 18, 1852, the steamboat *Pocahontas*, in backing out from a wood yard on the Arkansas river, collapsed both flues of the middle boiler, scalding eighteen persons, of whom eight died within a few hours after. The three boilers are two years old, 28½ feet long, 38 inches in diameter, with 14-inch flues. By inspection, I found that half of each flue is torn from the after head; one flue is flattened vertically, and the other one horizontally; the end sheet of one is much laminated, and has been burned in turning the flanch on it. The iron is scant one-quarter inch thick;—this is entirely too light, particularly if they carried the steam

* From the Lond., Edinb., and Dublin Philosoph. Magazine, February 1852.

to the extreme of the pressure gauge, (200 lbs.) The time elapsed has obliterated the marks of the water line—the flues appear as if they had been partially overheated. The position of the gauge cocks in the outside boilers show that these were worked on the scant water system. The middle boiler has *no gauge cocks in it*, and yet the inspector's certificate, dated New Orleans, January 24, 1852, pronounces them in good order! The shell is uninjured, and no other damage was done to the boat.

For the Journal of the Franklin Institute.

Notes on the Steamship "State of Georgia." By J. V. MERRICK, Esq.
(With a Plate.)

This steamer, before noticed in this *Journal*, has recently been completed, and will leave this port as pioneer of the line to Savannah, Geo., on the 12th of May. Her engineer's trial trip was made on the 27th and 28th April, 1852, and an account of her performance, with the principal dimensions, &c., will doubtless be interesting to many readers.

HULL constructed by Vaughan & Lynn, Kensington.

Length on deck,	210 feet.
" between perpendiculars,	200 "
Breadth,	33 "
" over guards, (extreme,)	56 " 10 inches.
Depth of hold,	21 "
Depth of lower hold,	13 "

RIGGED with three masts; three square sails on foremast; fore and aft sails on main and mizzen mast.

DRAFT, loaded, estimated at 12 ft. 6 in., to 12 ft. 9 in., which is about 6 inches more than was intended, owing to the unusual size and weight of timbering.

MACHINERY constructed by Merrick & Son, Southwark.

Space occupied in lower hold, by machinery and full complement of coal (155 tons,) is 54 feet 9 inches long, and whole width of ship as follows:—

Engine space, 13½ feet wide, with bunks on each side,	30 feet 9 in.
Fire room,	8 " 3 "
Boilers,	14 " "
Passage forward of boilers,	1 " 9 "

Total, 54 " 9 "

Between decks, space 12 feet 3 inches wide, and 46 feet long; centre of shaft, 80 feet forward of stern post.

ENGINE, single side lever, with condenser below cylinder; air pump on same end, and outside steam chests having balance valves.

Cylinder,	72½ in. diam. 8 ft. stroke.
Nominal horse power,	220-6
Air pump,	46½ in. dia., 37 in. stroke.
Lead on steam valves (lift,)	¼ inch.
Lead on exhaust valves (lift,)	13-16 inch.

Is fitted with H. Allen's momentarily adjustable cut-off arrangement.

PADDLE WHEELS, ordinary radial, with single floats.

Diameter over floats,	29 feet 4 inches.
Width of "	9 " 3 "
Depth of "	1 " 10 "
Number of "	28
Mean dip on trial,	4 " 4½ "