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edge of the disc farthest from the magnet, rub upon it while the disc turns, and the rotary motion is caused by a treadle. When the disc revolves about six times in a second, the needle of the multiplier deviates from its natural position at an angle of about 30° .

On joining the copper disk with another of iron of the same diameter, no change was perceived in the deviation. The experiment was repeated with a more powerful magnet, weighing twenty kilog. (44.11 lbs.) and sustaining one hundred kilog. (220.5 lbs.) but the tension of the electricity of the revolving disc was not increased. The diameter of the first disc was eleven centimetres, (4.3 inches,) that of the second seventeen centimetres, (6.7 inches.)

It appears that copper acts under the influence of a magnet, as a steel bar tempered and magnetized, under that of an electrical current—it is known that the current, whatever may be the power of the Voltaic battery, does not sensibly increase the force of a magnet of tempered steel.

ART. XIV.—*M. Ampere's communication to the Academy of Sciences upon an experiment of M. Pixii relative to a Current produced by the Rotation of a Magnet with an improved apparatus, Oct. 29, 1832. Translated from the Annales de Chim. et de Phys., Sept., 1832; by OLIVER P. HUBBARD, Assistant in the Chemical Department in Yale College.*

M. HACHETTE has reported the experiments made with an apparatus constructed by **M. Pixii**, for producing an electrical current, by making a horse shoe magnet revolve, face to face, with a fixed horse shoe of soft iron, the latter being wound with a silk-bound copper wire; after having obtained vivid sparks with an apparatus, in which the magnet supported thirty livres, (33 lbs.) and the wire around it made five hundred turns, a magnet supporting more than one hundred kilog. (220.5 lbs.) and wound with a wire of one thousand metres, (1093.6 yds.) was used and the following effects were produced. 1. Vivid sparks: 2. Shocks of considerable force: 3. A numbness and involuntary movements of the fingers, when immersed in vessels of acidulated water with which the ends of the wires communicated: 4. A great divergence of the gold leaves in the condenser of Volta: 5. A rapid decomposition of water, previously mixed with a little sulphuric acid to increase its conducting power.

In these different experiments the current took place in the conducting wire in a different direction at each semi-revolution of the

magnet ; for instance in the decomposition of water, the oxygen was disengaged at first in one tube and the hydrogen in the other ; at the next semi-revolution the hydrogen was evolved in the first, and the oxygen in the second ; of course the two gases were mingled in each tube.

To obtain them separate, M. Pixii attached to this apparatus the bascule, which M. Ampere invented to change the currents in his electro-dynamic experiments. The bascule in this new apparatus supports a rod, upon which rests a semi-circle attached to the magnet, and which holds the bascule depressed on one side during a semi-revolution of the magnet, and during the next semi-revolution, the bascule becomes free, and is depressed on the other side by a spring.

On the first trial of this arrangement, the bascule plunged alternately into the troughs filled with mercury, like the bascules of M. Ampere ; but when the movement became rapid, the mercury was so powerfully agitated as to leap out of the troughs.

M. Pixii obviated this inconvenience by substituting, for the mercury, small plates of copper, amalgamated upon the surface to render more perfect their contact with the points of the bascules which strike them alternately. By this ingenious arrangement, the electric current, in the part of the conducting wire beyond the bascule, takes place always in the same direction ; whence it follows that oxygen alone is disengaged in one of the tubes and hydrogen in the other, and the two gases are obtained separate.

It is worthy of remark, that all the other circumstances remaining the same, the decomposition of the water becomes more rapid in this case than when the electric current is alternating ; which is, probably, owing to the molecules of the water being previously and properly disposed for decomposition ; whereas, when the current is alternating, it is necessary that they turn themselves at each semi-revolution of the magnet.

As to the sparks and shocks, and the action upon the leaves of the electroscope, they are alike produced by a current in the same direction and the alternating current, since all these phenomena result from an instantaneous action of electricity developed in the conducting wire, sufficient to charge the condenser as far as the tension of the current permits.

Prof. Emmet had not seen the articles, on electro-magnetism, contained in the nine last Nos. of the *Ann. de Chim. et de Phys.* to Sept. 1832, inclusive, when the proof of his paper passed through his hands.—Ed.