ELECTRICITY.

An interesting experiment, which seems to have a bearing on the action of Edison's friction telephone, has been recently described by Herr Koch. When a plate of platinum or palladium is polarized by means of an electric current, the friction of these metals against a plate of moistened glass increases immediately. To measure the friction, Herr Koch uses the metal in the form of a hemispherical button, resting on the bottom of a glass cup, filled with pure or acidulated water. The button serves as pivot to a magnetic needle, which oscillates under the action of the earth; the decrease of the oscillations measures the friction of the pivot. Polarization is produced by the current of the Daniell element, one pole of which communicates with the metallic button, while the other terminates with a platinum wire entering the water of the cup. The polarization by hydrogen produces no effect, but polarization with the pole oxygenated is found verv efficacious. The friction was increased, through this polarization, in the ratio of 2 to 3, and sometimes in that of 2 to 4. This increase of friction appears immediately the circuit is closed, and disappears immediately when the current is reversed; but it disappears slowly, like the polarization itself, when the circuit is merely opened. It increases with the electromotive force of the polarization by oxygen. Palladium behaves like platinum. Gold (18 carat) gave no effect.

M. Desprez has lately attacked the problem of transmitting, by means of an electric current, the motion of a motor A to a receiver at some distance B, as a rigid axis between the two would do, so that the angular velocity of B should be always equal in amount and sign to that of A. (The particular case was that of getting within a railway carriage a rotation identical with that of the motor wheels of the locomotive.) On the shaft of the transmitter A are fixed two commutators, each of which reverses the current that traverses it twice each turn; but the positions of the shaft corresponding to these inversions do not coincide; they follow each other at intervals of a quarter of a turn. The receiver consists of a permanent magnet or electro-magnet, between the branches of which are two straight electro-magnets, capable of rotating round an axis which coincides with that of the magnet. The currents sent through these electro-magnets from the shaft A produce the desired effect. This apparatus (it is noted) effects the transmission of work of a motor from one point to another *with conservation of the angular velocity* (which has not been realized in any electric motor hitherto used), the latter varying from 0 to 2,400 turns per minute. The alternating currents required may be generated by a magneto-electric machine. Again, any motion may be considered as the resultant of two movements of rotation; hence this apparatus, with a simple mechanism added, would serve for transmission of a motion of drawing, or writing.

The steadiness of the incandescent light over that of the arc has long been understood, but hitherto the cost of the one has been so great that practically it was out of the question for general use. This will account for the little progress made by the Werdermann light. The cost is due principally to the consumption of carbon. Again, it is well known that the consumption of carbon, in an atmosphere containing no oxygen, or in a vacuum, is reduced to a minimum. Many inventors have tried to make lamps to retain a perfect vacuum, but have failed. It is easy, however, to make a water-tight joint, and by surrounding this with water Mr. Brougham has solved one of the problems of the incandescent lamp. The oxygen originally in the lamp globe is quickly exhausted, and then the atmosphere consists of gases which do not combine with carbon, and the result is very slow combustion or disintegration. The water-tight joints having been obtained in the manner above indicated, the globe is partially filled with water, so that when placed over the lamp globe, the water is well over the cap. This water globe is fastened by means of clamps and screws. The inventor states that while the carbon burns away at the rate of six inches per hour in the open air, it burns only one-eighth of an inch per hour when in the water-covered globe. This shows an enormous saving in the cost of carbon, and if it can be shown that the saving thus obtained is greater than the cost of the extra power absorbed by the incandescent lamp over that of the arc, a decided step will have been made towards furnishing a light that can without difficulty be applied to ordinary sized rooms. We have seen this lamp, and can testify as to its steady light.

So long as the liquid in the vessel is above the cap of the lamp, no atmospheric air can enter the lamp globe, and at the same time the heat from the lamp is carried off or dispersed and the light diffused. Provision may be made for the removal and replenishing of the liquid in or for causing it to circulate, but we are of the opinion that the ground-glass globe will prove more satisfactory as it is than any addition to the apparatus can make it. We made inquiries as to the liability of the copper wedge to melt, but its size and its connection with so large and such good conductors removes all tendency in this direction. — *Electrician.*

A simple method of perforating glass with the electric spark is described by M. Fages in a recent number of *La Nature.* The apparatus required consists (1) of a rectangular plate of ebonite, its size, for a coil giving 12 ctm. sparks, about 18 ctm. by 12; (2) of a brass wire passing under the plate and having its pointed end bent up and penetrating through the plate—not farther. This wire is connected with one of the poles of the coil. A few drops of olive oil are placed on the ebonite plate about the point, and the piece of glass to be perforated is superposed, care being taken not to imprison any bubbles of air. The olive oil perfectly accomplishes the object of insulating the wire. One has then only to bring down a wire from the outer pole of the coil, on the piece of glass, above the point of the lower wire, and pass the spark. By displacing the glass laterally for successive sparks, it is easy to make a close series of holes in a few seconds.

A new form of electric lamp has been invented by Mr. Charles Stewart, M. A. It consists of a number of square carbon rods placed radially upon a disc of wood, or metal, in such a manner that the inner ends of the carbon rods form a complete circle. There is a circular opening in the wooden disc through which the electric light is seen from underneath. The carbons which are all forced toward the centre by a uniform pressure, move forward as they are consumed, and together form the positive electrode of the lamp. The negative electrode consists of a covered hemispherical cup of copper which before the current enters the lamp, rests upon the ring formed by the carbons. On the current entering the lamp an electro-magnet raises the metal electrode, and the electric arc is then formed between the circle of carbon and the metal electrode. There is a flow of water through the latter to keep it cool. The inventor claims for his lamp the following advantages. (1). It is automatic in its action. (2). Burns for a considerable period. (3). Throws no shadows. (4). Simple and inexpensive in structure. (5). The intensity of the light may be increased if desired.

THE TELEGRAPH AND EARTHQUAKES.—A recent letter from Mr. W. A. Goodyear, now director of the governmental mining and geological survey of San Salvador, states that more than 600 shocks of earthquakes were felt there during the last ten days of 1879. They were heaviest about Lake Ilopango, where a shock occurred on the 23rd of December, which broke the telegraph wire asunder and "made the ground on which we stood a perfect network of cracks, opened new springs of water, increased the rivulets in the vicinity to ten times their usual volume, muddied the waters of the lake in many places, and rolled hundreds of thousands of tons of rocks down the steep hills in the form of landslides." As a sequal to these earthquakes, came the irruption of a volcano in the middle of Lake Ilopango on the night of January 20th to 21st. The volcanic island resulting now measures over five acres in extent, and shoots up a column of steam into the air over 1000 feet in height. This is the first instance we have heard of earthquakes interrupting land telegraph lines, though there are cases on record of their interrupting cables.