A MAGIC BEYOND THE MAGICIAN'S.

WONDER-MOVING FEATS THAT SCIENTISTS PERFORM.

Plates and Nails that Dance — A Lamp that Burns Under Water. Nikola Tesla's Fiery Hand.

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[From a Special Contributor.]

Any one of our modern electrical scientists could, by departing from the dignity of his calling, launch out as a professional magician and make a fortune on the stage. Nikola Tesla, Edison, Prof. Elihu Thomson, and many other earnest workers surpass in their laboratory experiments anything done behind the footlights. No Hindoo juggler can do more in the gentle art of mystifying than the electrician. His apparatus is simple and his results are amusing enough to sound a recall.

Thomas A. Edison several years ago had a small motor which ran without any apparent electrical connection. It stood upon a table and whirled rapidly. It was very mystifying in the then stage of electrical science and savored of perpetual motion. The real secret lay in the fact that projecting from the base of the motor were two sharp metal pins which, when the motor was laid upon the table, penetrated the thin veneer of the table top and made connection with wires underneath.

An electrician would disdain such a device now. Recent progress has shown that it is not necessary to have even the connecting wires. Motors now run and depend for their driving power on the electrical excitement of the atmosphere. They may be far removed from the appliance generating the power and yet work away merrily. Tesla will hold a lamp in his hand, stand in the middle of a large room away from all wires or metallic connections, and the lamp will glow and send forth a radiance not to be equalled. What could be more magical than this?

THE SPINNING EGG.

Could Christopher Columbus have visited the Chicago Exposition he would have found his trick of making an egg stand on end very much improved by aid of electricity. In one of the exhibits was a large egg on end upon a table. Visitors wondered what made that egg stand on end. Then it was discovered that the egg was not standing, but whirling—whirling with such rapidity that it seemed to stand still. Suddenly the egg stopped moving and fell down upon its side. Now, wonderful as this seemed, it is a very simple phenomenon, easily produced, and an everyday occurrence in the laboratory. The egg belonged to Nikola Tesla, and is at present in his laboratory in New York city. Inside the egg were arranged several coils of wire, and these were acted upon by several other coils near by, but unconnected by any mechanical process with the egg itself.

FREAKS OF THE ALTERNATING ELECTRIC CURRENT.

When the alternating current of electricity, as it is called, began to be understood several years ago, it was noticed that very peculiar phenomena were attendant on its action. When, for instance, a peculiarly-wound coil of wire was placed near another coil that was traversed by an alternating current, a repulsive action took place, and the coils were driven away from each other. Under other conditions, attraction resulted. By manipulating the coils a series of attractions and repulsions were produced, and thus it became possible to get any number of strange effects, one of them being the apparent causeless whirling of the egg. Another is the action of a bunch of keys which, when thrown upon the table in place of the egg, whirls so rapidly that its form is indistinguishable. A copper plate or a copper ring is affected precisely the same as the coil when placed near an alternating current coil. It will be driven away or attracted. How easy, then, for the electrician to turn magician and mystify an audience. A simple coil underneath a table top will create more mystery for the uninitiated than a spiritualistic seance. The intervening wood of the table cuts no figure in the general calculation. The alternating current is a great leveler. It cares for nothing. A coil traversed by the current will create all around it an electrical atmosphere that will penetrate wood, glass, or anything else of the same nature. Prof. Elihu Thomson of Lynn, Mass., has performed a number of experiments which show the great possibilities for amusing which may be got out of the alternating current.

THE FLYING RING.

Perhaps the most wonderful trick of all is the one in which the current overcomes the force of gravity. A short, stout column of wood stands upon the laboratory table. Near by is a copper ring, a trifle larger than the column. Concealed in that column of wood is a coil traversed by an alternating current. Now, strange as it may seem, it is impossible to keep that ring on that column. Place it there and it will fly off the moment you take your hands away. Throw it on, it will balance itself in mid-air around the column until the electricity overcomes the force of gravity, and then it will fly away as before. The repulsive action has taken place and forced the ring away from the immediate neighborhood of the concealed coil. The effect is really magical. The ring can be made to stay near the coil in one way—by taking advantage of the attractive action. You may stand the ring on edge, as it were, on the projecting core of such a coil, and the attraction at this point will hold it firmly.

A LAMP THAT BURNS ONLY UNDER WATER.

It is one of the principles of the alternating current that when a coil is traversed by it, it has the power to induce a current to flow in another coil, if the latter is brought within the electric atmosphere of the first coil. Prof. Thomson has taken advantage of this fact to produce a very mystifying and very beautiful experiment. You may walk into his laboratory some day and behold an incandescent lamp floating around in a jar of water, and connected to a dynamo. You may safely lift the lamp out of the water and examine it. The light will be extinguished immediately, and, if you will examine the lamp, a small coil will be found in the base of it. Put the lamp back into the water, and it will immediately relight. Yet there is no substance in the water to cause the phenomenon. It is pure water. But there is a coil concealed under the table, traversed by a powerful alternating current. By means of it a current is induced in the coil, which is secured in the base of the lamp, and the latter is thus lighted. Such an affair, used upon the professional stage, would cause the greatest wonderment. The jar filled with water is merely used for effect, for if the lamp is taken out of the water and laid on the table it will light up just as quickly. Such an exhibition as this ought to cause grave forebodings to be experienced throughout the match trade.

BALLS AND PLATES SPINNING UNDER WATER.

The queerest aquarium in existence, probably, is owned by Prof. Thomson. For it he uses the same jar and water in which the lamp was exhibited. His fish are differently shaped and constructed from any that ply the sea. In fact, they consist of some small metal balls and a metal plate. Tossed lightly into the water they immediately revolve at a speed sufficient to churn up the liquid to a degree. They strike each other and careen from side to side at a great rate, and the physical action is very instructive and interesting to watch. As in the case of the lamp, the water is not necessary. The balls may be laid on the plate on the table and they will whirl as fast as did Tesla's egg. It is the old story of the coil concealed beneath the table.

A MAGICAL HOOP.

In the same laboratory they take a metal plate and spin it on a pivot, not by any mechanical means, but by surrounding the plate and pivot with what appears to be a large hoop attached to a handle. The hoop, however, is really the core of a large, electric coil, wire being wrapped round and round it. The repulsion and attraction set up in the hoop cause the metal plate to revolve. If the bunch of keys before mentioned were thrown on the table and within this hoop, it would whirl as rapidly as in the first instance. So would the egg.

Prof. Thomson has described how he has laid a common steel file on a table underneath which a coil was fixed, and caused metal discs to revolve in his hands by merely holding the discs near to the file. But even this is not as curious as a feat performed in another laboratory not long since. A number of metal plates were laid out on a table as though in preparation for a dinner party. Then some people were asked to seat themselves at the table, and no sooner had they done so than the plates suddenly began to jump into the air. Nothing could have been more startling, and there was a general and instantaneous stampede. Then it was disclosed that each plate had been laid directly above where a coil was placed under the table.

Following is an idea obtained from the above, one of the persons present suggested that church contribution boxes could be made on this plan with curious results. Such a box has been made, and it is simply impossible to get money to stay in it. Pennies especially have no liking for it and fly out in a surprising manner.

THE DANCING NAILS.

The same principle which governed the above was applied in another direction during an exhibition which was given by the Franklin Institute of Philadelphia some time ago. In the middle of the hall stood a plain pine table and on it was a handful of ordinary tenpenny nails. The nails lay in a heap and it looked as though some workman had thrown them there. Spectators were busy watching other things and the nails were passed with a glance. However, the eyes of one old lady and gentleman nearly popped out of their heads when happening to look at the nails, the latter all got up on end, heads up, and actually bowed and scraped to the astonished couple. The table was surrounded in an instant by astonished people, before whom the nails paired off and danced and waltzed. Some fell on their sides but immediately got up and bowed an apology. Coils beneath the table did it all. The head of the nails, containing more bulk than the points, sustained more repulsive action and consequently got farthest away from the coil, which in its turn was regulated from another part of the room.

NIKOLA TESLA'S STARTLING EXPERIMENTS.

Mr. Tesla, in the course of a recent evening lecture, requested that the lights be turned off. It was done, and then the audience saw a truly magic sight. There stood the electrician with a small lamp in his hand and his hand above his head. Rays of unequaled beauty came from the lamp and spread down over the body of the man. The lamp was a simple affair and no wires connecting it with a hidden source of supply. It was as if the lamp of Aladdin had been rubbed and beautiful jewels were gleaming forth.

This was followed by another and even more startling experiment. Again the room was darkened. The lecturer became invisible to the expectant spectators and then a human hand, plain and distinct, a hand of fire, reached out from the darkness and, all transparent, was seen waving aloft, while shooting out from it were sparks and streams of light.

In exposition of these seeming wonders let me give Mr. Tesla's own words:

TESLA EXPLAINS THE WONDERS.

"When two conducting bodies are insulated and electrified, we say that an electrostatic force is acting between them. This force manifests itself in attractions, repulsions and stresses in the bodies and space or medium without. So great may be the strain exerted in the air that it may break down, and we observe sparks or bundles of light or streamers, as they are called. These streamers form abundantly when the force through the air is rapidly varying. I will illustrate this action in a novel experiment in which I will employ an induction coil. The coil is contained in a trough of oil and is placed under the table. The two ends of the secondary wire of the coil pass through two columns of hard rubber which protrude to some height above the table. Attached to one wire running through the hard rubber is a large sphere of sheet brass.

"I now set the coil to work and approach the free terminal with a metallic object held in my hand, this simply to avoid burns. As I approach the metallic object to a distance of eight or ten inches, a torrent of furious sparks breaks forth from the end of the secondary wire which passes through the rubber column. The sparks cease when the metal in my hand touches the wire. My arm is now traversed by a powerful electric current, vibrating at the rate of one million times a second. All around me the electrostatic force makes itself felt, and the air molecules and particles of dust flying about are acted upon and are hammering violently against my body. So great is the agitation of the particles that when the lights are turned out you may see streams of feeble light appear on some parts of my body.

"I can make these streams of light visible to all by touching with the metallic object one of the terminals as before, and approaching my free hand to the brass sphere which is connected to the other terminal of the coil. As the hand is approached, the air between it and the sphere, or in the immediate neighborhood, is more violently agitated, and you see streams of light break forth from my finger tips and from the whole hand."