RECENT INVENTIONS

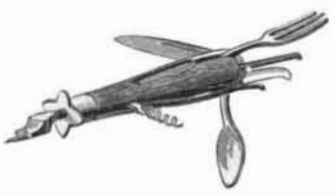
Improved Funnel.

This funnel is of the class in which provision is made for the escape of air from the vessel which is being filled. The liquid funnel is surrounded by an air funnel, leaving an intermediate space for the escape of air. These funnels are held in such local relation that ribs are rendered unnecessary in either funnel. Connecting pieces are riveted at their lower ends to the top of the outer funnel, and at their upper ends to the outside of the inner funnel. This keeps always clear and unobstructed the intermediate space, and also supports the liquid funnel above and upon the air funnel.

This useful invention has been patented by Mr. Harry E. Gifford, of New Bedford, Mass., who may be addressed for further information.

Combination Can Opener.

This tool combines a can opener, knife, fork, spoon, tweezers, wire cutter, toothpick, and corkscrew. The can opener at the small end of the handle consists of four blades and an adjustable point forming the fulcrum and center for opening blades. To the larger end of the handle are pivoted the knife, fork, spoon, and wire cutter, all adapted to fold down into recesses formed in the handle. A corkscrew is similarly pivoted at the middle of the handle, and at the larger end are recesses containing tweezers and a toothpick. When all of the parts attached to the handle are folded down against it and shoved down into it, their outer surfaces stand about flush with the main body of the handle, so that they in no way interfere with the use of the tool in opening cans, and any one of them may be turned or drawn out for use as occasion may require. The device is very complete and compact, and is convenient for travelers, excursionists, surveying, prospecting, and hunting parties. This invention has been patented by Mr. Henry Hartman, of Salt Lake City, Utah Territory.



Why Cochineal and Carmine are so Costly.

The *Ironmonger*, London, explains why the beautiful cochineal and carmine colors are so expensive. It says: One of the best and most powerful animal dyes used in the arts and manufactures is the body of the female cochineal insect, dried. This insect exists on a species of cactus, and when alive is about the size of a ladybird, or perhaps a trifle smaller. It is wingless, rather long, equally broad all over, and is marked behind with deep incisions and wrinkles. It has six feet, which curiously enough are only of use directly after birth, and secures itself to the plant by means of a trunk which is found between the fore feet, and derives its nourishment from the sap. The male cochineal is like the female only during the larva period. It changes into chrysalis, and eventually appears as red flies. The female deposits some thousands of eggs, which she protects under her body until they are hatched, and on the appearance of the young ones the parent dies. While the young are in the larva state their sex cannot be determined. They lose their skins several times, and while the female fixes herself on the plant, the male, after getting over the pupa state, is winged. Two or three months is the extent of the life of these little insects. They are gathered before they lay eggs, and are then rich in coloring matter.

Carmine is prepared from the cochineal insect, the *Coccus acti*, which is collected by brushing the branches of the cactus with the tail of a squirrel or other animal; this is very tedious work. They are killed by immersing them in boiling water, and this has to be done at once or they would lay their eggs, and thereby lose much of their value. There are many processes for preparing the carmine. The French process may be taken as an example: one pound of the powdered cochineal insects is boiled for fifteen minutes in three gallons of water; one ounce of cream of tartar is then added, and the boiling continued ten minutes longer; then one ounce and a half of powdered alum is thrown in, and the boiling continued for two minutes longer. The liquid is then poured off, and set aside for the carmine to settle down. In other processes carbonate of soda or potash is used.

Imperishable Flowers.

There were recently exhibited, by Sir Joseph Hooker, at a meeting of the Royal Society, some leaves and petals of flowers and some twigs and mosses which were removed from the tomb of the founder of the eighteenth dynasty of Egypt, who died 3,500 years ago. The vegetable remains were treated in warm water until they sufficiently expanded to allow a determination of their species and in most instances an identification sufficiently close to allow them to be classified. And, as an evidence of the stability of vegetable types, the mummy flowers plants were the same as those now existing. The blue water lily, *Nympha cerulea*, the white water lily, *Nympha lotus*, the willow, *Salix safaf*, seeds of the *Juniperas phœnicea*, and several grasses, together with lichen indigenous to Greece, were found and identified.

The Great Discoveries in Electricity.

We extract the following few interesting passages, in regard to the rapid progress made in electrical science, from a learned discourse pronounced on the 16th of December last, by Prof. Ch. Montigny, on the "Great Discoveries made in Physics since the End of the Eighteenth Century":

"Franklin was asked, precisely a hundred years ago, what ought to be thought of the balloons that the brothers Montgolfier had just invented. 'Can you foresee,' he answered, 'what will become of the child that has just been born?' This wise answer tells us that at the birth of a discovery we are unable to prejudge the extent of the benefits that it has in reserve for us. Had any one foreseen, a few years after this answer, the importance that the invention of Volta's pile was going to acquire?

"This discovery of the finest instrument of modern physics, which marked the last year of the eighteenth century, was brought about by circumstances which, although generally known, it is proper to recall briefly in this place.

"Galvani, a professor of anatomy at Bologna, discovered in 1786 that the hind members of a frog, freshly prepared, underwent a contraction when a metallic arc established a communication between the muscles and lumbar nerves of the animal. Struck by so singular a fact, Galvani studied it with all that sagacity with which he was endowed. In order to explain the phenomenon, which caused great sensation in the scientific world, he supposed the existence, in the nerves, of an animal electricity, or vital fluid, and presumed, in likening its action to that of the electricity of the Leyden jar, that, on passing from a nerve into a muscle through the metallic arc, this fluid caused the contractions of the animal. This explanation was generally accepted.

"Volta, a professor of physics at Pavia, who had already signalized himself by remarkable discoveries concerning electricity, did not long share the ideas of Galvani. He called the attention of physicists to the metallic arc which put the nerves in connection with the muscles, and attributed the effects observed, not to the action of a peculiar fluid, but to the special action of an electric current that the contact of heterogeneous substances called forth. In support of his opinion, he established particularly this fact, which had been remarked by Galvani himself, that the contractions of the frog's legs were much more marked when the communicating arc was formed of two different metals.

"Then began a memorable contest, one of the most fecund that the history of science presents, between Galvani and Volta. Although the existence of electric currents in living animals was afterward ascertained, Volta came out victorious from this contest, in which he covered himself with immortal glory by the invention of the pile in 1800—scarcely a year after Galvani's death. Volta was led to this discovery in the following way: He found, in the first place, by means of the condensing electrometer—an extremely sensitive instrument that he had previously invented—that two disks, one of copper and the other of zinc, became electrified, the former negatively, and the latter positively. These effects being due exclusively to contact, according to him, he imagined that he should increase their intensity by multiplying the number of couples formed by each of the two metals, and by superposing them each in the same order. But these attempts remained fruitless until the idea occurred to him to separate each couple by a good non-metallic conductor, such as moist paper. He at once found that in two couples separated in this way the intensity of the electric couple was immediately doubled. This important fact recognized, nothing was more simple than to superpose a certain number of couples of two metals arranged in the same order, and to separate them in the same way. This was what Volta did, and he found that his apparatus was much more energetic when the disks of paper or cloth that separated the couples were wetted with salt water.

"Such is the succession of the principal facts which led to the invention of the pile—'the most marvelous instrument,' says Arago, 'that man ever invented, not excepting either the telescope or the steam engine.'

"Volta made his discovery known to Sir Joseph Banks, President of the Royal Society of London, in a letter dated at Como, March 20, 1800, and in another to La Metherie, a French savant.

"The importance of Volta's invention was at once appreciated, and great honors were bestowed upon him, particularly by Bonaparte, who invited him, in 1801, to come to Paris, and who eagerly assisted at the meeting of the Academy at which the man of genius repeated the experiments that had been the starting point of his admirable invention.

"The discoveries of the decomposition of water, salts, and alkalies were made by means of the electricity of the pile, and were accomplished with single liquid piles, which present the grave inconvenience of giving currents whose intensity rapidly decreases. We must not forget that it was Becquerel, senior, who established the principles upon which is based the arrangement of constant current piles, or those employing two liquids, and that it was in 1829 that he made known the first element of this kind. A few years afterward, in 1836, the English physicist, Daniell, invented the couple which bears his name, and which became a very practical apparatus. This invention obtained for its author the Copley medal. It is the predecessor of all those different kinds of elements in so extensive use at present, and that are applied in telegraphy, electro-metallurgy, and in a multitude of works that have made the pile as common an instrument in shops as it is valuable in laboratories.

"The letter from Volta to Banks which figures in the 'Philosophical Transactions' (1800) is very lengthy, and is written in French. In it Volta describes, under the name of 'electromotive apparatus,' the columnar instrument, and the 'Couronne des tasses.'

"The name of 'pile' given to Volta's apparatus soon prevailed, because the couples of the two metals are *piled* up vertically in the columnar form of the apparatus. Volta's invention is described in the *Journal de Chimie et de Physique*, under the name of 'electric pile' (vol. i., 1801).

"The letter to La Metherie figures in the *Journal de Physique* of that savant (1801).

"Volta was born at Como, on the 18th of February, 1745, and died there March 5, 1827. His fellow citizens and his admirers have erected a beautiful monument to his memory over the spot where he is buried, and a statue on one of the principal squares of the city.

"The city of Bologna also has had the honor of erecting a statue to Galvani, who immortalized his name by his great discovery. He died on the 4th of December, 1798 (one year before the invention of the pile), at Bologna, where he was born on the 9th of September, 1737.

"When Volta came to Paris, Bonaparte, who was a member of the Classe des Sciences de l'Institut, proposed that the Classe should decree to the visitor a gold medal for his invention. The proposition was unanimously carried. The following year, the First Consul, who had presented Volta with a special gift from the State funds, created two prizes—one of 3,000 francs, for the best experiment made during the course of each year on the electric fluid, and the other of 60,000 francs, 'for the person who, through his experiments and discoveries, should advance electricity and galvanism as much as Franklin and Volta had.' Foreigners of all nations were admitted to the competition. The prizes were successively decreed to Erman, of Berlin, in 1806, to Davy, in 1807, and then to Gay-Lussac and Thenard in 1809.

"Napoleon the Third having in 1852 instituted a prize of 50,000 francs in favor of the author of the most useful applications of the Volta pile, the money, after several competitions without result, was accorded in 1863 to Ruhmkorff for the invention of his induction coil.

"The foundation of the Volta prize having been maintained, it was decreed, in 1880, to Graham Bell, of Boston, for the invention of the telephone.

"During the same year in which Volta announced his invention in England, Carlisle and Nicholson decomposed water by means of it. Soon afterward Cruikshank, who gave it the form of the trough, decomposed some salts, and W. Henry some acids. But it was the remarkable labors of Berzelius and Hisinger, in 1803, which, at this epoch, solved the question of the decomposition of salts by the pile, by showing the law of the carriage of their elements to the electrodes. Davy made a still quicker leap toward the application of the pile to chemical decompositions, by isolating, in 1807, by the aid of a powerful pile, potassium, sodium, and other metals. Bear in mind that we owe to this illustrious chemist the first experiment on the electric light, this having been realized in 1813 by passing, *in vacuo*, a very strong current between two points of calcined charcoal placed very close together.

"It was Faraday, who later on, toward 1832, established the laws of electrolysis of decompositions by currents.

"Berzelius, the celebrated Swedish chemist, was born on the 20th of August, 1779, and died on the 7th of August, 1848, at Stockholm.

"Davy was born at Penzance (Cornwall) on the 17th of December, 1778, and died at Geneva, on the 28th of May, 1829."—*L'Electricite.*

Gold from Peruvian Rivers.

The whole of the Chucamba (Peru), says a correspondent in *Iron*, for a number of leagues above and below the Temple of the Sun is auriferous, and the inhabitants of the province of Huamelies, through which it passes, obtain by washing the sand, and by means of sheepskins, 200,000 or 300,000 dollars' worth of gold annually. The wool on the skin is cut out until it is about half an inch in length. The skins are then anchored down, with the wool side up, by means of loose stones placed on them, in and below the various rapids, in which position they are suffered to remain from six to twenty-four hours. They are then carefully raised out of the water, turned wool side downward into a batea (tub) of water, and thoroughly washed; the gold falling from the wool of the skin is finally collected from the bottom of the batea. Sheep were unknown to the Incas, and as they had obtained an immense amount of gold from this Pactolean stream, it is presumed that they used the skins of the llama (*Camelus lacina* of Linnæus) and those of the vicuna (*Camelus peruanus*, or *vicuyna*, of Linnæus)." The above will not only be of interest to the general reader, but will also furnish a wrinkle to gold miners similarly situated.

ENTHUSIASM is one of the most powerful engines of success. When you do a thing, do it with a vim. Do it with your might. Put your whole soul into it. Stamp it with your own personality. Be active, be energetic, be enthusiastic and faithful, and you will accomplish your object. Truly has Emerson said: "Nothing great was ever achieved without enthusiasm."