The Gatherer
An Illustrated record of Invention Discovery & Science

Correspondents are requested, when applying to the Editor for the names and addresses of the persons from whom further particulars respecting the articles in THE GATHERER may be obtained, to forward a stamped and addressed envelope for reply, and in the case of inventors submitting specimens for notice, to prepay the carriage. The Editor cannot in any case guarantee absolute certainty of information, nor can he pledge himself to notice every article or work submitted.

A Watch-Camera.

The "photoret," a new pocket camera, shaped like a watch, is shown in our illustration. The lens is

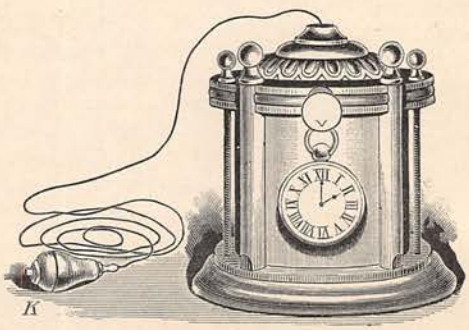
very small and of fixed focus, nevertheless the camera takes a miniature photograph the size of a postage-stamp, which is capable of being enlarged to four or five times its dimensions. The camera can be manipulated with one hand, the ring and stem at the top working the shutter and bringing the film into position for the next picture. It is a magazine camera with six plates in the charge, but thirty-six plates or six charges are supplied with it. The number of pictures taken is shown by a figure which comes into view; and a "time exposure" can be made by inserting a common pin in the hole marked "time stop," and pressing the watch-stem.

Diamonds from Coal Gas.

Several months ago we referred to the experiments of M. Moissan on making diamonds from sugar in the electric furnace, and we have now to record the manufacture of the gem from ordinary coal gas by heating it under the atmospheric pressure to a temperature between 2,000° and 3,000° C. This has been done by M. Gustave Rousseau, another French chemist. The gas was saturated with vapour of benzine and passed through a hollow block of lime in which a voltaic arc was maintained. After two hours both graphite and crystals of black diamond were found. Acetylene gives the same products with the same treatment, and M. Rousseau intends to try the heavy carburets got from coal tar and petroleum residue. As yet these artificial diamonds have been very small, and unsuitable for jewels. We may add that M. Moissan has improved his electric furnace by lining it with plates of carbon and magnesia one over the other, and enclosing in it a tube of carbon which is heated by the electric arc. By charging the tube with raw material he is now able to continuously reduce the metal chromium from its ores after the manner of a smelting furnace.

An Electric Watch-Stand.

The watch-stand which we illustrate is intended to show the time at any hour of the night, and contains a small battery of dry cells in the ornamental case. By pressing a button in the knob, K, connected by wires to the battery, the small incandescent lamp is lit and the watch face illuminated. The wires are twelve feet in length, and thus allow of the stand being as far away from the operator, who, in fact, may be lying in bed.



AN ELECTRIC WATCH-STAND.

Autoconduction.

M. D'Arsonval, a well-known electrician, has made a series of interesting experiments showing how the human body conducts electrical impulses of great intensity without pain, or indeed sensible discomfort,

FIG. 1.

provided these are produced by alternating or see-saw currents of high frequency, that is to say, many thousands of oscillations a second. Such currents are produced by sending the current from an alternating current dynamo through a special induction coil or transformer, which transforms the dynamo current into one of, say, 15,000 volts of "pressure," and changing its direction, say, 10,000 times a second. When the latter current is sent through a coil of wire in Fig. 1, an electric incandescent lamp, connected as shown round the head of the experimenter, is lit up, the electrical influence passing through his head. Again, when such a current is passed through a coil of wire encircling the body of the experimenter as shown in Fig. 2, he is able to light an incandescent lamp by simply holding it in his hands by short pieces of wire joined to its terminals.

Milk and Liquid Oxygen.

A practical use for liquefied oxygen has been found in sterilising milk. The late Paul Bert, the well-known French *savant* and statesman who lost his life while on a political mission in Tonquin, was the first to show that oxygen prevents the souring of milk—that is to say, its fermentation—by destroying the germs or "vibrions," which produce it; and M. Villon has applied liquid oxygen to the purpose. Tubes of the liquefied gas are now actually on sale in France for mixing with milk in order to preserve it.

Cerium in Photography.

MM. Auguste and Louis Lumière, the well-known Parisian photographers, have made some interesting experiments with salts of cerium such as the sulphate and nitrate, in lieu of silver salts, for taking photographs. Paper steeped in aqueous solutions of these salts becomes sensitive to light, which reduces the ceric to a cerous salt and stains the paper, thus producing a picture the tint of which varies with the developer used. Thus phenol gives a grey picture, aniline a green, naphthylamine a blue, parasulfanic acid a red, and so on.

Flexible Glass.

According to a German scientific journal, a material called "flexible glass" is made by dissolving four to eight parts of gun-cotton in one part of ether or alcohol and adding to the solution two to four parts of a non-resinous oil, and four to ten parts of Canada balsam. The mixture is spread on a plate of glass, and dried in a current of air at a temperature of 50°. The residuum is a hard flexible transparent mass, resisting alike acids, alkalies, and salts. It is odourless, and its inflammability can be reduced by adding chloride of magnesium, while zinc white gives it an ivory tint.

Light and Germination.

Professor H. M. Ward, F.R.S., has submitted the spores of various bacteria or germs of disease to the action of the different rays of the spectrum of sunlight and of electric light, with the result that only the blue and ultra-blue rays are found to injure or destroy them. The infra-red, red, yellow, and green rays are apparently harmless. The injurious action begins at the blue end of the green rays, attains a maximum in the blue rays, but continues into the violet rays, and beyond them. Strange to say, the interposition of a thin sheet of

AUTOCONDUCTION.—FIG. 2.

glass between the prism giving the spectrum and the bacteria had the effect of diminishing the deadly character of the rays. It follows that a naked light shining directly on bacteria is a better germ-killer than one enclosed in glass; hence Professor Ward thinks that

A CORNER WARDROBE.

the rays of a naked electric arc lamp might be used for disinfecting hospitals and railway carriages.—While upon this subject we may mention that the Rev. G. Henslow has investigated the influence of coloured light on germination, and finds that seeds in general germinate regardless of the light, but that a variety of larkspur is positively injured by it. Ordinary daylight, as a rule, promotes germination better than coloured light, and plants grown under glass do not thrive so well as those in the open air.

A Corner Wardrobe.

Our illustration shows a new corner wardrobe just patented, and which is so portable that it could easily be taken away with anyone who was removing for a while into country or seaside quarters where accommodation for hanging clothes is apt to prove scanty. The sides of the wardrobe, in which are fixed the hooks, will fold up for packing purposes, if required. But on the other hand, when fixed, the wardrobe makes a very satisfactory piece of furniture, the principle of which will be readily understood from our drawing.

The Origin of Gold Nuggets.

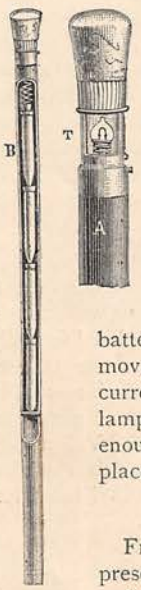
It is still a mystery how the nuggets of gold which are found in alluvial diggings have been formed. Many are of opinion that the gold has been deposited in nodules from a solution, layer upon layer. Professor A. Liversedge, a well-known geologist of New South Wales, has recently shown that, while gold can be artificially made into lumps in this way, natural nuggets in alluvial diggings have really been derived from gold-bearing rocks and rounded by attrition.

A Metal Reservoir.

M. Gérard, water engineer to the city of Bordeaux, has constructed a reservoir of metal and raised above the ground to a height sufficient to give the required pressure. The building is supported on iron columns standing on concrete foundations let into the soft soil. Girders supported by the pillars carry a floor of metal, on which two elliptical basins or water tanks are erected, and a dust-tight roof covers the whole. The reservoir, which is of great capacity, was made by the firm of Chaulon and Sons, engineers, Bordeaux.

Curiosities of Tree-Growth.

Some remarkable cases of natural grafting have been observed lately in America. One is that of a sugar maple which has coalesced with a white pine in a woodland of Wisconsin. The trunks keep apart for three and a half feet above the ground, where they unite into a single stem. It is supposed that friction in the wind or the nibbling of a deer has frayed the green bark when the trees were saplings and caused them to adhere. Other cases of white pines growing together have been reported, in one of them as many as four trunks uniting at a sufficient height above the ground to allow persons to walk under. A veritable "bow-knot" formed by the branches of a tree has also been described; and in the heart of two trunks—one of burr oak, the other of white wood, sawn up for lumber—the antlers of deer were found embedded. It is supposed that the animals had caught the tips of their horns in the green wood and broken them off. In the heart of another trunk of hickory wood a horse-shoe was found; but how it got there is quite a mystery.



AN ELECTRIC CANE.

An Electric Cane.

The walking-stick which we illustrate contains a small electric lamp in the handle, as will be seen through the glass at T. The lower part of the cane, A, encloses a series of Leclanché cells forming an electric battery, which is shown at B. By a slight movement of the head of the cane the current from the battery is sent into the lamp, and the cane yields a light strong enough to read by or show the way in a dark place.

A Home Conserver.

Fruits and vegetables can, we all know, be preserved by excluding the air from them as well as by sugar, or vinegar; but hitherto the former method has been almost exclusively in the hands of manufacturers. Our engraving shows a domestic utensil for conserving in this manner. The principle on which it

is based consists in driving out the air and killing the germs in the fruit or vegetable by heat, and keeping it in a hermetically sealed, that is to say, an air-tight, case. In the figure, A is a glass vessel into which the fruit or vegetable, after being washed is placed. The

A HOME CONSERVER.

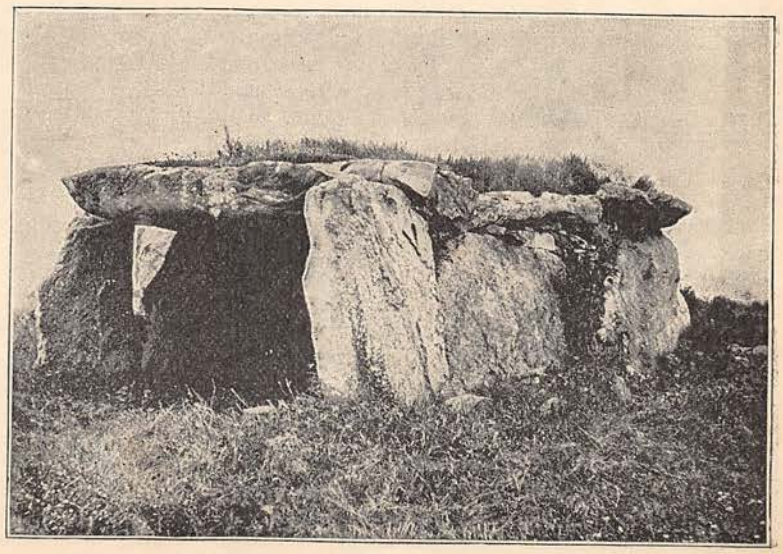
vessel is then closed and plunged into a copper basin or boiler, B, containing boiling water, for a specified time. The lid of the vessel is made so as to let the hot air and steam escape from within but admit no fresh air from without. The bath shown has a double bottom as well as a cover, and can warm seven vessels at once, some of which, as shown at C, are of porcelain instead of glass.

Sugar and Work.

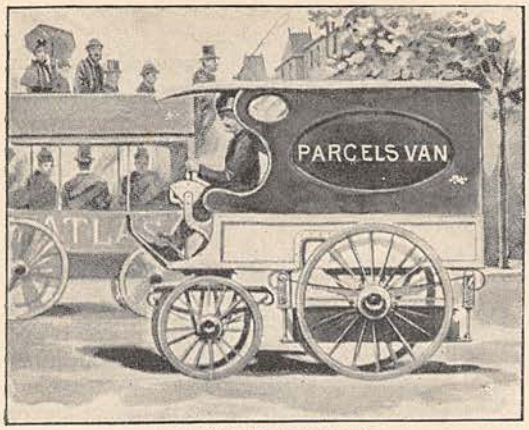
Dr. Vaughan Harley, in a paper recently read before a meeting of the Royal Society, adduced a number of facts showing that sugar in food is a producer of muscular energy. By means of an apparatus called the ergograph, he measured the work done in raising weights of 3 and 4 kilogrammes to a certain height with the middle finger of each hand. When the subject of the experiments had fasted for 24 hours, and drunk only water, sugar not only lengthened the time before he grew tired, but increased the work done by 61 to 76 per cent. Sugar added to meals was also found to promote the muscular activity of the subject. Thus 200 grammes (about 3,000 grains) added to a small meal increased the work done from 6 to 39 per cent. In the same way 250 grammes of sugar added to a large mixed meal improved the resistance of the subject to fatigue, and increased the amount of work done from 8 to 16 per cent. The same quantity of sugar added to the meals during a working day of 8 hours increased the work done from 22 to 36 per cent.

The Dolmens of France.

Dolmens, that is to say, rude artificial caves or cells made of large stones, several upright for the walls and one or two laid over all for the roof, are found not only in the United Kingdom, as for example "Kits Coty House," in Kent, but in France and other western countries of Europe. Our illustration represents one at Germes, Maine-et-Loire, France, which is a good specimen of this very primitive order of architecture. They are sometimes surrounded with stones, and from the skeletons found in them, along with implements and trinkets, it is tolerably certain that they are the first family vaults or mausoleums of our ancestors. French archæologists have recently studied these interesting memorials of the distant past, and M. Carrière, President of the Society for the Study of Natural Science, at Nîmes, has come to the conclusion that the first builders of these dolmens were ignorant of the use of metals, and belonged to what palæontologists call the "Neolithic Age," that is to say, the period during which men employed implements of polished stone. Weapons of copper and bronze, and even Roman articles, are however found in some, and prove that the dolmens were still made or at least used in the "Bronze Age," and perhaps later. Who the original builders were is not yet ascertained beyond a doubt; but they seem to have been a race of long-heads, that is to say, dolicho-



DOLMEN AT GERMES (MAINE-ET-LOIRE).
(From a photograph taken for the "Commission des Monuments Historiques," Paris.)



AN ELECTRIC PARCELS VAN.

cephals, because, so far as can be gathered from these relics in the south of France, the broad-heads or bracycephals do not make their appearance amongst them until the age of bronze. We may add that French archæologists have recently made a discovery which tends to throw light on the origin of the "standing stones," or megaliths which, like the dolmens, are common in this country and Western Europe, from Scandinavia to Spain, and are also found in North-Western Africa. Specimens of an old language carved on the stones have been found, and if it should be deciphered we may yet identify the builders of Stonehenge, Callernish, and Karnac with some existing race—who knows?—perhaps the mysterious Basques, whose language is a mystery to philologists. Hardly anyone believes now in the old theory that Stonehenge and other megalithic monuments were built by the Druids. They are really of enormous age, and date back to the earliest races of Western Europe and North Africa, whose blood nevertheless flows in our veins, let us call ourselves "Anglo-Saxons" or "Celts," or what we will. Such studies tend to unite the various races in fraternal feeling, by showing the community of blood which exists over vast areas, and only a narrow-mindedness, based on ignorance and prejudice would discountenance or check them.

An Electric Parcels Van.

Our woodcut shows a parcels van driven by electricity, which has been introduced into the metropolitan district. The current is supplied by accumulators in the bottom of the vehicle, and the electric motor is geared to the hind wheels. Switches, brakes, and steering gear for controlling the van are all within easy reach of the driver, who occupies the usual place in front. There are six degrees of speed all within the limits allowed for street and road travelling by machinery. The van is lighted by the current, and the motive power is equivalent to a pair of horses. The accumulators, which are of light construction, hold a charge for a journey of thirty miles, and the cost of charging and maintenance is given as 2d. per mile of run.

An Automatic Fishing-Net.

A net which automatically rises to the surface and thus encloses the school of fish to be caught, has been invented by M. Trouvé, a French electrician. The net is weighted along the lower edge and has a pneumatic tube along the upper, which can be inflated by an air-pump on the shore or fishing-boat. A lure in the shape of electric lamps submerged in the water, or a bait, is employed to draw the fish within the compass of the net, and the air-float is then filled, causing the net to rise to the surface and hem in the fish. The net is considered more humane than the ordinary ones, as it does not frighten them nor destroy their eggs. We may add here that at a recent meeting of the Physiological Society of Berlin, Dr. Bembo, of St. Petersburg, read a paper in which he advocated cutting the large blood-vessels of the neck as the most humane mode of slaughtering animals. When this is done unconsciousness supervenes in a few seconds, and the movements observed are due to cerebral anæmia. Moreover, as is well-known, the flesh of animals which have bled to death is most easily kept.

The Phonograph and Languages.

It is well known that the phonograph is now used by travellers in taking down and preserving strange languages, but probably most people are unaware that it is now used in American schools for teaching pronunciation and foreign languages. The instruments are adapted for a large number of pupils listening at once, and these can either study the pronunciations for themselves or under the direction of a teacher.

SHORT STORY COMPETITION.

AWARD.

The FIRST PRIZE of £4 is awarded to
JOHN BAVINGTON JONES,
185, Snargate Street, Dover;

The SECOND PRIZE of £3 to
MARGARET MACKINTOSH,
Creich F. C. Manse,
Cupar, Fife, N.B.;

The THIRD PRIZE of £2 to
ALEXANDER MORRISON,
102, Redcliffe Gardens, S.W.

HONOURABLE MENTION is accorded to
Mrs. E. S. CURRY, Southwark, S.E.;
B. E. DUFFETT, Redhill;
C. THOMSON, Oxford.

We may remind our readers that the Six-Part Serial Story Competition, announced in our December number, closes on the 1st inst.; and in the Gardening Competition, of which full particulars were given on page 160 of our January number, June 23rd is the latest date for receiving entries.