The GATHERER
An Illustrated record of Invention Discovery & Science

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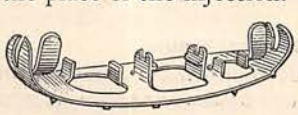
A Skate Patten.

A SKATE PATTEN.—FIG. 1.

This little device enables a skater to put on his own skates at home. Over the skate he fastens the patten, as shown in Fig. 1. The construction and working of the patten (Fig. 2) will be readily understood. It is easily slipped on and off by means of spring clips which fasten to the runner of the skate.

Inoculating for Diphtheria.

The new method of vaccinating for diphtheria and croup, which has been introduced by M. Roux, of Paris, and Herr Behring, of Berlin, consists in cultivating the bacterium of the disease in beef tea, then inoculating horses with it. At the end of eighty days a horse thus treated is able, without suffering, to supply lymph for inoculating the human subject. The serum of its blood, drawn from the jugular vein, is a clear lymph, capable of resisting the bacterium of diphtheria; and when injected under the skin of diphtheritic patients, after the manner of morphia, it works a remarkable change in their condition. In the course of a few hours the fever declines, the face resumes its old tints, and the subject feels much better—in fact, lively. A slight eruption sometimes appears on the skin round the place of the injection. So far, the remedy has reduced the death-rate from diphtheria by one-half, where it has been tried, and hopes are entertained of its proving still more efficacious. We may add that M. Viquerat, a Swiss, has also begun to treat desperate cases of consumption by inoculation of the serum of asses "immunised," to adopt a needful word, against the bacterium of that dreadful scourge; and the results of his treatment will be awaited with interest



A SKATE PATTEN.—FIG. 2.

A Simple Reading-Lens.

A simple device for enabling short-sighted persons to read with comfort is shown in the figure. It consists of a glass tube filled with water, which is sealed and mounted on a wire frame or handle, as shown. The cylindrical lens magnifies the text line by line, and the reader has only to move it down the page.

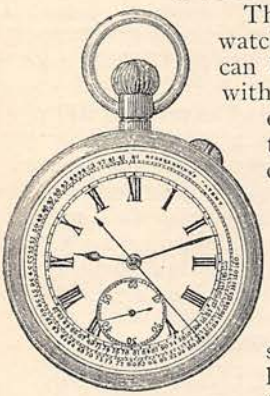
Probably some people after a few trials may be able to find a clear glass phial of the proper curvature which, when filled with water and corked, will serve the purpose quite well.

Tea and Digestion.

A German physiologist has tried the effect of tea on the process of digestion by means of

an artificial digestive fluid. His results bear out the accepted doctrine that tea, like coffee, retards digestion. The tannin or tanning principle of the tea is chiefly instrumental in hampering the digestion, and hence people with weak digestions should not drink brown, or "strong" tea, that is, tea which has been allowed to infuse for any time, and thus "draw" out the tannin of the leaves. Moreover, as China tea, as a rule, contains less tannin than the Indian sorts, it is preferable for brainworkers and persons of sedentary habits.

A Pulse Watch.



The figure shows a watch by which the pulse can be told in the dark with accuracy. The longest hand travels round the dial in thirty seconds, and its scale is graduated to give the number of beats of the pulse in a minute. To use the watch for this purpose the hand is started by pressing the knob, and when twenty beats have been counted, it is stopped in the same way, and the figure gives the rate. By a third pressure the hand is brought back to its starting place.

Electric Lighting from Balloons.

Captive balloons are now used to signal with, the balloon being illuminated inside with incandescent electric lamps, in which the current is stopped and started and the light put on or off by means of a current key, as in telegraphing. The current, of course, is conducted to the lamps by an insulated cable. An extension of this idea to electric lighting is now being tried in the German army. Large arc lamps of 5,000 candle power or more are suspended from the captive balloons, and fed with electricity by means of a cable from the ground. The light, properly reflected downwards, illuminates a large area, and enables the evolutions of the army to be carried out as during the day or, at least, during bright moonlight. The idea, if successful in practice, will probably be tried in civil life for lighting gardens and open spaces. It may be added here that Mr. J. Munro, C.E., has suggested the desirability of Arctic and other travellers trying a "balloon post" to carry despatches from them into civilised regions. Small or "pilot" balloons, with the packet of letters attached, would suffice, as will be understood by those who have read "How I Discovered the North Pole" in our June number.

A Plastic Marble.

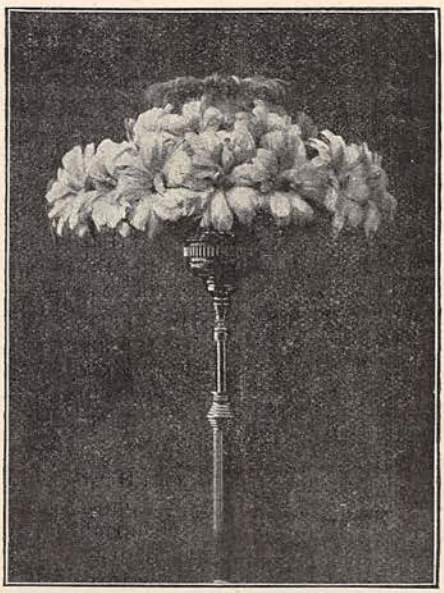
An artificial marble, which can be applied to walls and furniture while in a soft or plastic condition, has been brought out. The "marble" is delicately veined, like the natural varieties, while being hard and durable. The fact that it can be applied like stucco permits of its fitting easily to its place and being as easily repaired when broken.

Sealing by Electricity.

Bottles are now hermetically sealed with a metal capsule by the ordinary process of electro-plating. A conductive priming is applied to the mouth of the vessel and a layer of metal deposited on it in an electrolytic bath, which effectually excludes the air. It is proposed to extend the process to the sealing of preserved meats.

Feather Shades.

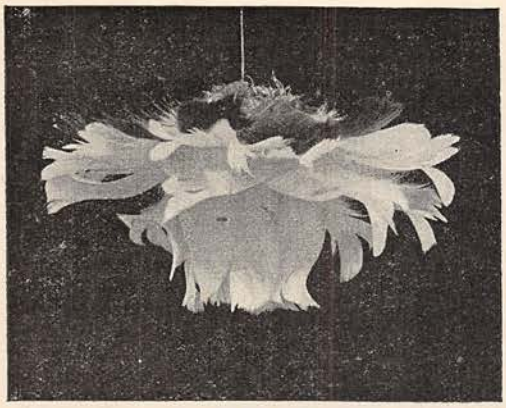
The feather shades for electric lamps and candles which we illustrate are designed by Miss Beatrice Davenport, and made of natural plumes of various tints artistically arranged with regard to shape and colour. The effect of the shades is pretty, and quite different from that obtained from silk, lace, or paper.



FEATHER SHADE (1).

The Largest Cable.

The new Atlantic cable was actually laid in twelve days by the *Faraday*, belonging to Messrs. Siemens Brothers & Co., in spite of



FEATHER SHADE (4).

bad weather, fogs, icebergs, and the grappling off Waterville for the shore end, which had slipped from the buoy. This makes the record as far as transatlantic lines are concerned; and the new cable, which is the property of the Commercial Cable Company, is an improvement on the older lines, as it has the largest copper conductor, and gives the highest speed of signalling for its length. The copper wire inside the cable actually weighs 600 lbs. per mile, that is to say, one-third more than the heaviest wire hitherto laid across the Atlantic Ocean

A Museum of Journals.

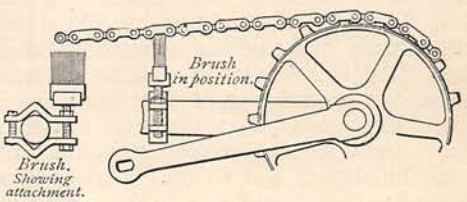
M. Oscar Forkenbech, of Aix-la-Chapelle, has made a hobby of collecting newspapers and forming a museum of them at great expense during the past forty years. Besides procuring rare prints, he has subscribed to several hundred journals in all parts of the world, and every morning receives specimens in thirty languages. Of late, however, a large number of papers have been sent to him gratuitously by editors sympathising with his object. Amongst his curiosities are a specimen of the largest journal in the world, and that boasting the *smallest* circulation, for it only appears once in a century. This is the *Illuminated Quadruple Constellation*, which, appearing at New York in 1859, will not reappear until 1959. It is a sheet about 9 feet long by 5 feet wide, and contains eight pages of thirty columns each. The printing, we are told, is well done, and the paper very durable. Assuredly it had need to be so in order to complete the volume!

The Fate of Niagara.

Professor J. W. Spencer, an eminent American geologist, has arrived at the conclusion that the great lakes of North America lie in valleys of erosion formed during the Ice Age, when the continent stood 3,000 feet above its present level. The bed of an ancient river, called the Laurentian River, can still be traced from Lake Michigan through Lake Huron to Georgian Bay, and thence to Lake Ontario, near Toronto. At one time a great part of the lake region was united in a single sheet of water, which divided into two basins, one comprising Lakes Superior, Huron, and Michigan, the other, Lakes Ontario and Erie. The three upper lakes discharged into the St. Lawrence by way of Lake Nipissing and the Ottawa River, the two lower by the Niagara River. At this period the fall of this river was only 220 feet, but it increased to 320 feet in course of time, and the waters of the upper lakes eventually passed through it. The Falls of Niagara have, according to Professor Spencer, been in existence for 31,000 years, but the drainage of the upper lakes has only passed over them for 8,000 years. So far as can be seen at present, the great cataract will come to an end in from 7,000 to 8,000 years, before it has receded to Lake Erie, through the waters of the upper lakes discharging into the Mississippi by way of Chicago.

A Chain Brush for Cycles.

Our woodcuts represent a small brush mounted on cycles so as to clean the driving

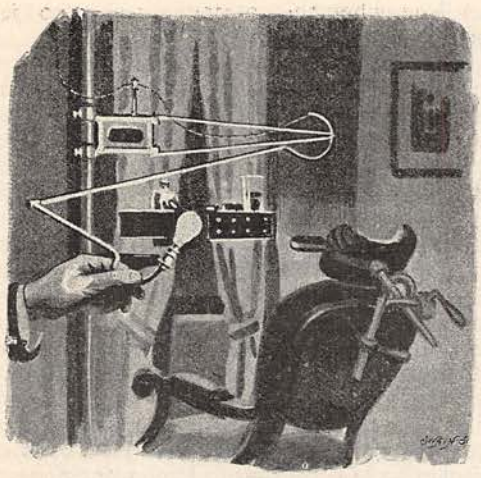


A CHAIN BRUSH FOR CYCLES.

chain. It is fitted with aluminium for lightness, and fixed to the machine by a screw collar, so as to sweep the chain as it passes above. We may mention here that a bicycle can be used for surveying land with great ease, especially if the ground is flat and pretty hard. Thus, to measure a square field it is only needful to run the cycle over its length and breadth while counting the number of turns made by the wheel in each case. The distance covered by the wheel in a single turn multiplied by the number of turns, gives the length and breadth of the field and these multiplied together give the area.

An Adjustable Electric Lamp-holder.

Our illustration shows a kind of bracket for holding electric lamps which permits the light to be brought into any position. This is



AN ADJUSTABLE ELECTRIC LAMP-HOLDER.

effected by the peculiar design of the hinged, or folding arms, as will be seen, and a flexible wire conveys the current to the lamp.

A Mechanical Fluid.

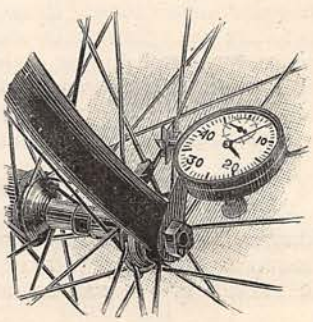
American engineers have developed a new mechanical device in the form of an artificial fluid. If a row of hard balls touching each other are pressed upon at one end the pressure is transmitted to the other end, and the same thing holds good of a quantity of balls in a cylinder—for instance, lead shot in a glass tube. The balls in a body behave like a fluid and transmit pressure, as in the hydraulic press. The new device is capable of being applied in several ways: for example, in transmitting power to a distance, signalling to and from an engine-room, opening and closing bulkheads, and so on. The balls are preferably of steel, and vary in diameter from $\frac{1}{8}$ to $\frac{1}{4}$ inch.

The Origin of Our Parishes.

Just as the researches of anthropologists are proving that the English are not really Anglo-Saxons but a very mixed people, and the Irish not Celts but another very mixed people, so the researches of archæologists are showing more and more that manners and customs hitherto ascribed to the Anglo-Saxon invaders are in reality Romano-British, or earlier. Beyond bringing a good deal of fresh blood into the country, the Anglo-Saxons do not seem to have changed the pre-existing conditions much, even as regards the destruction of towns and extermination of the natives. Mr. H. T. Crofton, for example, has recently shown in a paper to the Manchester Geographical Society that the irregular boundaries of existing counties and townships in England were created by the demands of the pre-Roman village communities, and the later manors only altered them slightly or perpetuated them. The detached portions of parishes are sometimes caused by a river shifting its course, but they are mostly due to the habits of the so-called "Celtic," but in reality only Celtic-speaking Britons. Thus, amongst the lower classes the youngest son inherited the homestead, and amongst the upper all the children had equal rights to the strips of arable and pasture lands which were not broken up. The strips of arable land were divided by ridges of grass called "bylands," and across the ends of the furrows a "headland" was ploughed at right angles to the rest—the "head rig" of the modern Scotch. Measurements were made by local standards, generally the height of the tallest man in the village. In 1340, after the Norman settlement of the country, the system of holding land was changing to permanent ownership, and ultimately the strips were enclosed. As the townships increased in population more and more of the surrounding forest or waste was brought under cultivation. Mr. Crofton illustrates his arguments by the Manor of Withington, four miles south of Manchester. The subject is important in many ways, and has an historical bearing, for certainly if our parish and country bounds are "Celtic," the Anglo-Saxons cannot have driven out or extirpated the Ancient Britons, as we have all been taught to believe by our historians, who confessedly rely only on the fact that so few Celtic words occur in the English language. But as we see in Ireland or the Highlands and elsewhere to-day, one language can take the place of another without borrowing more than one or two words of peculiar import from that which it displaces. Hence this argument is practically worthless, and the "Celtic" blood of the English is no doubt largely due to Britons who remained on the ground.

A New Cyclometer.

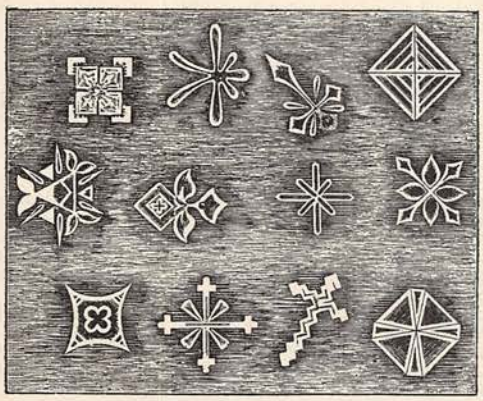
The instrument shown in our woodcut is designed to register the travel of cycles in miles or kilometres. It is only about two inches in diameter, and weighs three ounces. A driving-pin attached to a spoke of the cycle wheel works the mechanism, and the distance



travelled is shown by the hands on the dial, the large one giving the full miles, and the other the fractions of a mile.

Flowers of Ink.

Crystals of snow are beautiful objects in the microscope, but it is not so well known that similar crystals are formed in ink, which, unlike those of water, do not melt with heat. They are prepared for examination by letting a drop of ink fall on a plate of glass, spreading it out a little, and letting it dry. A microscope magnifying from 50 to 200 diameters will reveal the crystals on the bluish-black



background of the ink. Their appearance will be gathered from the accompanying figure. When the ink is allowed to dry slowly, they are larger than when it is dried over a flame ; but a slight acceleration of the drying process gives a great variety of shapes and a medium size. Ink is an aqueous solution of nut-galls and sulphate of iron with gum Arabic, and an antiseptic such as phenic or salicylic acid, but the composition of the crystals has not been accurately determined, though they appear to be of magnetic oxide of iron, or of white pyrites, a bisulphide of iron known as marcasite, and perhaps of both. They do not polarise light, and they are deliquescent, that is, melt like salt in damp air.

The Canal des Deux Mers.

Since the days of the Roman Empire the idea of connecting the Atlantic Ocean and the Mediterranean Sea by a ship canal across France, and thus avoiding the long détour round Spain and the Straits of Gibraltar, has been entertained, and brought before the French Government. Sully, Richelieu, and Colbert had plans submitted to them for cutting such a canal through Languedoc, but the times were unpropitious for the enterprise. At length, however, a company has been formed in Paris for the purpose of making a ship canal between Bordeaux and Cette, thus uniting the two seas. Its completion would, of course, diminish the value of Gibraltar to the British Empire, and increase the naval power of France in the Mediterranean.

GARDENING IN DECEMBER.

BORDER flowers may be planted now in well-stirred soil. A wealth of beauty is at command of the amateur—beauty not expensive to get, some of the most lovely things that have come to us from other worlds costing only a few pence each. One can have the larkspurs, hollyhocks, roses, and many other things that have been already pointed out in these pages. It is unfortunate so many consider gardening an expensive hobby. It is nothing of the kind, if one actually does the work, not letting a jobbing gardener even clip the ivy. The beneficial effect of gardening upon the health is thus secured. Plant roses on brier stock in favourable weather, also bush fruit trees, those delightful little trees on the paradise stock, which are suitable for all gardens, large or small, especially the latter, in which it is, of course, impossible to grow large trees.

If bulbs for spring-flowering are not yet planted, do not delay. Even now it will mean late flowering. September is *the* month for this work. Plants in windows must not be exposed to frosts or cold winds, and in the case of those remarkable for their foliage, like the ever-welcome parlour palm (Aspidistra), sponge the leaves with tepid water at least once a week. Things in bloom must be kept out of gas-lighted apartments.

This is the season to commence in earnest for next year's blossoming. Some readers may have just moved into a new house, and want to turn the present dreary ground, called a "garden," into something worthy of the name. If the soil is poor or heavy, thoroughly dig it up, and leave it exposed for sun, air, and frosts to sweeten it.

A garden is not a garden if it be not spread over with beautiful flowers, and now is the time to lay the foundation by getting a thoroughly good soil. Everything will then be ready for the annuals in spring, and, if the space be large enough, for vegetable and fruit trees also.

Climbers, whether roses or such things as the clematis, may be planted. The passion-flower requires the warmest and most sheltered corner. As regards roses, none is more beautiful than Gloire de Dijon, that loves to scramble over cottage chimneys and thrust its flower-laden shoots into the latticed window.