

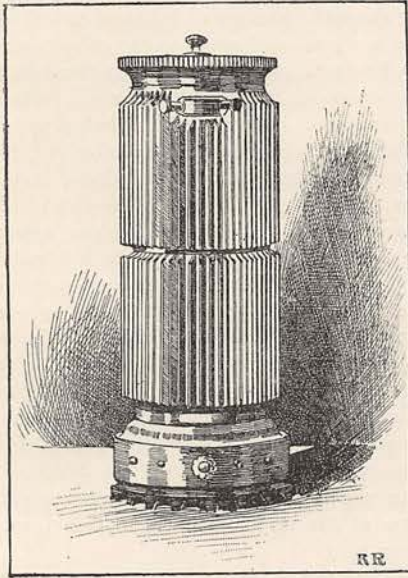
## THE GATHERER:

AN ILLUSTRATED RECORD OF INVENTION, DISCOVERY, LITERATURE, AND 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 Thermo-Electric Stove.

Dr. Girard, a well-known French electrician, has invented a stove heated by gas or coke, which at the



same time generates a thermo-electric current sufficient to charge an accumulator of 16 cells and feed a number of 10 candle-power electric lamps. The electro-motive force of the current it yields is 35 volts, and the useful energy about 44 watts. The stove is illustrated in the figure, and its peculiarity is that the wall is composed of 700 thermo-electric pairs, the hot joints being inwards and exposed to the hot gases of the interior, while the cold joints are outwards and provided with vertical flanges which help to cool them. Each pair consists of an alloy of antimony and zinc and a plate of nickel or white iron. The current is collected by suitable wires, and the fumes escape by a chimney.

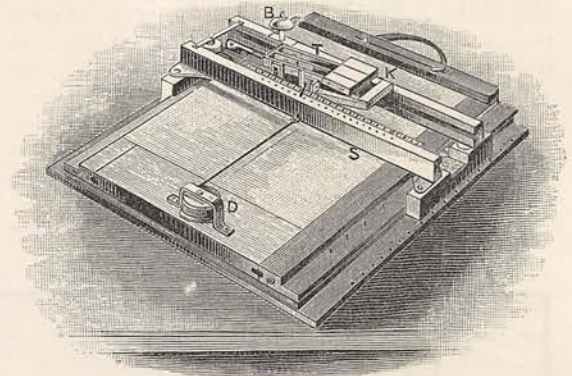
### A New Cover for Jugs.

A new and striking improvement in covers, or mounts, for hot-water and other jugs has recently been patented, and deserves to be widely known. In appearance it much resembles the old form of cover, but its working is totally different. Just above the handle of the jug, and projecting about a quarter of an inch, is a very thin rod with a small knob attached to it, which, when slightly pressed, lifts the cover—by means of a small lever working inside the jug—to the height required. When the pressure is removed the weight of the lid causes it to close again automatically, and the pin is again forced out. This device is also used

with cream jugs, mustard jars, and a large variety of similar household utensils, and can of course be decorated to give quite a handsome look to the vessel.

### A Type-writer for the Blind.

The type-writer which we illustrate herewith is intended for the use of the blind, and its mode of



action is based on the ordinary apparatus for enabling the blind to "write," by means of a combination of "dots" made with an awl or stylus. In the type-writer the awl is replaced by several keys, *K*, like those of the ordinary type-writer, which punch the paper with dots. A slide, *S*, keeps the writing in one line, and the keys are carried by a traveller, *T*, which is moved across the board by means of a cord passing round a drum, *D*, containing a coiled spring; a bell, *B*, giving notice when the end of the line is reached. The machine is very ingenious, and is said to work well.

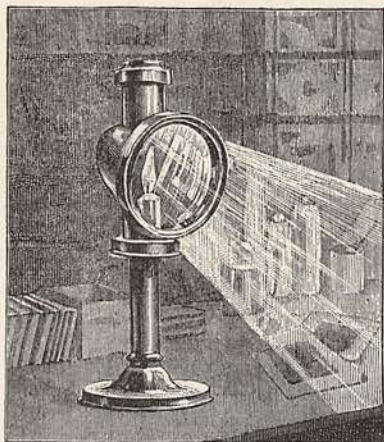
### Paper Horse-shoes.

The horses of the German artillery and cavalry regiments are now shod with paper. The shoes are made by cementing forms of parchment paper together and hardening them by hydraulic pressure, then rasping them to fit the hoof. As the iron shoe is notoriously defective, especially on slippery roads or streets, this news will be welcome to all who wish for a more humane horse-shoe. Recent experience in America and elsewhere points to the conclusion that shoes are not absolutely necessary for horses if the hoof is allowed fair play; but, at all events, the paper shoe may be regarded as a kind of artificial hoof. We may also mention that beakers and laboratory vessels, capable of withstanding acids, are now made in France. They are formed from a pulp containing 85 per cent. of wood and 15 per cent. of rags. After being dried in a current of warm air, they are placed in a hermetic

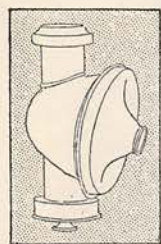


cylinder, and the air exhausted from their pores by an air-pump. After this a warm varnish of petroleum, ether, resin, paraffin, and linseed oil, is allowed to fill the pores, and the vessels are then baked in a second cylinder heated to 100° Centigrade, so as to drive away the volatile ether, which is condensed for further use. Another current of ozonised air oxidises the linseed oil, and the vessels are finally dipped in a bath of linseed oil and castor oil mixed with resin, then dried and exposed to another current of ozonised air. Thus treated they are strong, flexible, and impermeable to liquids. We may add that paper pulp is now bleached by ozone in France. The ozone is prepared by passing electrical discharges through oxygen gas and bringing it to bear on the paper pulp. The process is more rapid than bleaching by chlorine, and the ozone merely oxidises the colouring matter without attacking the cellulose of the material.

#### A Candle Lamp for Photographers.



The "Holiday" is the name given to a new candle lamp intended, primarily, for the use of photographers in changing and developing plates. Our engravings show the principle on which the lamp is constructed.



In use the parabolic reflector secures a very powerful light, and for purposes of transport the candle-tube slides into the reflector, and the base forms a protecting cap for the glass front of the lamp. For photographic use a ruby glass is of course employed, and special arrangements have been made in the construction of the lamp to prevent the escape of white light above or below the reflector; but for ordinary domestic use, for lantern readings, or for travelling, the ruby glass can readily be changed for a clear one.

#### Banana Meal.

Dr. John Dougall, of St. Mungo College, Glasgow, has recently drawn attention to the nourishing properties of bananas. Mr. H. M. Stanley, in "Darkest Africa," remarks that "for infants, persons of delicate digestion, dyspeptics, and those

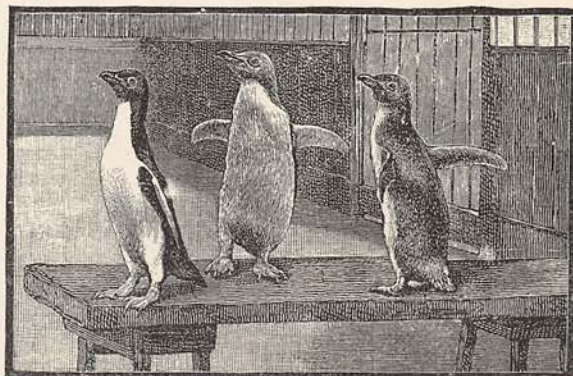
suffering from temporary derangements of the stomach, the flour, properly prepared, would be of universal demand." During his attacks of gastritis, the only food Stanley could digest was a gruel made of banana-flour and milk. Dr. Dougall has, therefore, made experiments with the meal, and comes to the conclusion that it should only be made from the ripe fruit in the country where it grows. Imported bananas, plucked while still green, are of course a mawkish apology for the ripe tropical fruit, and do not yield the same nourishment.

#### A Cure for Hyperacidity.

Excess of acidity in the stomach has been the subject of a large number of experiments by Dr. Wolff, a German, who has been led by them to give the following prescription, which has proved a successful remedy:—Sulphate of soda, 30 grains; sulphate of potash, 5 grains; chloride of soda, 30 grains; carbonate of soda, 25 grains; bichlorate of soda, 10 grains, are mixed together, and half a teaspoonful of the mixture is dissolved in half a glass of lukewarm water, and taken, while fasting, three times a day.

#### A New Penguin.

In the Fish House at the Zoological Gardens, Regent's Park, the visitor may now see a species never before brought to England—*Eudyptes antipodum*, from New Zealand. Adult males are about thirty-two inches long, and have the top of the head and cheeks pale sulphur-yellow reaching to the bill, the feathers of the forehead and crown lengthened, and having a shaft-streak of glossy black; the general upper surface and sides dull blue, upper surface of flippers bluish-black, whole under-surface yellowish-white; bill, dull brownish orange, legs and feet dark brown. The females are about the same size, but with the entire plumage less conspicuous, and the crown of the head only tinged with yellow. The specimen exhibited is a young bird, and has the white of the fore neck extending right up to the bill, and on to the face; there is a broad mark of brown behind the eye, and on the sides of the upper neck, and a tinge of yellow, with some indistinct pencillings of brown, replaces the coronal band. The wings of the penguin are quite useless as organs of flight, and are covered with what may be called



PENGUINS AT THE ZOO.



scales, rather than feathers. The whole of the penguins are diving birds, and the species are very similar in their habits, which are thus described by Darwin: "In diving, its little wings are used as fins, but on the land as front legs. When crawling, it may be said, on four legs, through the tussocks, or on the side of a grassy cliff, it moves so very quickly that it might easily be mistaken for a quadruped. When at sea, and fishing, it comes to the surface for the purpose of breathing with such a spring, and dives again so instantaneously, that I defy anyone at first sight to be sure that it was not a fish leaping for sport."

#### A Cavity Explorer.



Captain Manceron, a French inventor, has devised the spy-glass which we illustrate for examining the interior of dark cavities inaccessible to the eye itself. Our figure shows its use for exploring the inner surface of a shell, S, in order to discover flaws in the metal; but, of course, it is applicable to any kind of hollow apparatus. The telescope-tube, T, is fitted at its lower end, beneath the object-glass, G, with a small mirror, M, inclined at an angle of  $45^\circ$ , as shown; and under the mirror is a small electric incandescent lamp, L, fed by a current conveyed to it through the wires, W. The lamp illuminates the side of the enclosure, which is thereby reflected in the mirror and seen by the eye looking through the eye-piece.

#### A Simple Test for Diamonds.

It has long been known that certain diamonds not only exhibit phosphorescence when warmed in the hand or rubbed, but also when exposed for a time to a bright light. Mr. G. F. Kunz, an American man of science, has, moreover, shown quite recently that all diamonds emit light after being rubbed on wood, cloth, or metal. As paste diamonds and other clear, hard stones do not behave in this way, the fact becomes a test for the true gem which can be applied by the tyro. Emeralds also give out light under friction.

#### Spectre Photographs.

Mr. Arthur S. Green, an American photographer, gives the following method of making the camera a source of amusement by the production of "ghost" or "shadow" pictures—for example, a seated man starting back in terror from his own spectre. Make a background of the proper size by stretching out some black material. Place the subject, draped in white or in light clothing, in the right attitude to the right or left of the centre of the background, then focus the camera and expose the plate for half a second. The impression will be that of a shadowy and ghost-like figure. Take a chair and table, placing the chair in

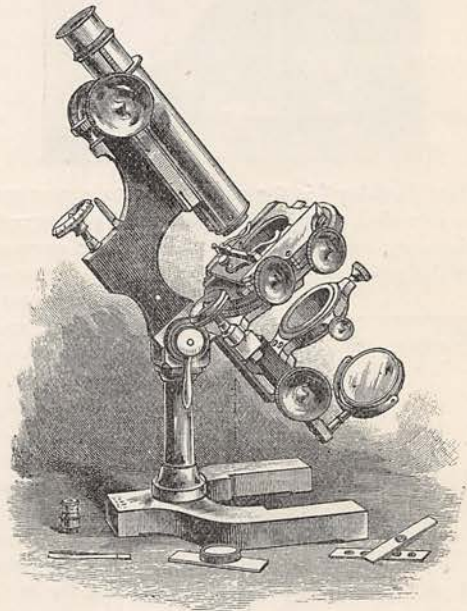
the centre of the background, and the table on the side away from the ghost. Seat the subject in the chair, with his head turned to the ghost; focus again, and give the plate a full exposure, which, if the light is good, should be about two seconds. Develop and print in the usual way. Any object to be seen through the ghost should be photographed with fifteen seconds exposure before taking the picture of the ghost. Other devices of the kind might be mentioned, but it will be more interesting to leave them to the ingenuity of the amateur.

#### Surveying by Photography.

Mr. E. Deville, the Surveyor-General of Canada, has introduced a rapid method of photographic surveying which has done good service amongst the Rocky Mountains. A special camera, carefully levelled, is employed, and the views are taken on measured spaces of ortho-chromatic gelatine plates. The photograph is in fact a plan of the ground, accurate enough for practical purposes. The method is likely to prove useful in what is called preliminary surveying for engineering purposes or in military operations.

#### An Improved Microscope.

The microscope which we illustrate has been constructed from the designs of Dr. Van Heurck of Antwerp, and unites the best features of modern microscopes. It is absolutely rigid, with fine adjustments for body and sub-stage, which for the first time



can be manipulated together simultaneously, while it is very compact and convenient. The telescope, when drawn out to the full, is a little over 10 inches long. The stage is  $4\frac{1}{2}$  inches in diameter, with concentric rotation, and a 1 inch motion in either direction. The foot is of bronze, and shod with cork to screen off the vibrations of the table.



### Souvenir Spoons.

Souvenir spoons are an American fashion, appealing to the national hero-worship and love of antiquities. The spoons are fine examples of cutlery, with ornamental handles usually terminated by a bust of some celebrity or a symbolical figure, or a relief of some historical event. Thus there is the "national spoon," with a bust of the late General Sherman; the "Washington spoon," with another of the patriot; the "Cleopatra spoon," with a head of Cleopatra on a base of lotus-flowers and royal asp; the "Plymouth Rock spoon," with a likeness of that famous boulder. The "Salem witch spoon" shows a witch accompanied by her cat and the immemorial broomstick. Fiction is represented by the "Rip Van Winkle spoon," the "Priscilla spoon," and so on. The "Priscilla spoon" is designed, not merely to assist the appetite, but the interests of love: it is a "spoon" in more senses than one. As the advertisement of the makers says:—"We believe this spoon conveys the purest sentiment for engagement,

souvenir, or leap year purposes. Embodying, as it does, Puritan simplicity and maiden sweetness, it has no equal, and we predict a large demand for it. How delicately would a laggard in love be stimulated by the gift of a fair counterfeit of her who naïvely said, "Why don't you speak for yourself, John?"

### Plumbers and Fever.

According to a lecture recently delivered by Dr. E. Duncan, of Glasgow, plumbers are not more liable than other persons to zymotic diseases believed to arise from sewage—for instance, typhoid, diphtheria, sickness, vomiting, diarrhœa, or sore-throat. They are sufferers, however, from the toxic effects of lead. As recent researches have shown, the air of a sewer which is properly ventilated is better than that of many crowded schools and churches. Dr. Duncan maintains that it is better than that of the houses in which half the population of Glasgow lives. If this be true for Glasgow, where the rooms are unusually large and the ceilings high, according to the Scotch mode, it must be more than true for London.

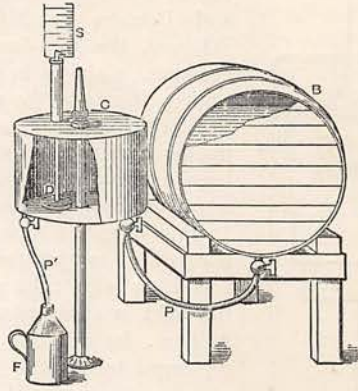
### A New Refrigerator.

Chloride of ethyl is now employed instead of chloride of methyl as a local refrigerator for producing the numbness which renders surgical operations painless. It is a colourless liquid with an agreeable odour, and is kept in glass tubes until wanted. The sealed end of the tube is then broken off, and the contents spirted on the skin. By its expansion and evaporation it occasions intense cold. The ethyl can also be used for removing the pains of

sciatica, neuralgia, and toothache, and for making small quantities of ice.

### A Liquid Measurer.

Our figure illustrates a device for measuring oil or other liquids contained in a barrel B and drawn off into a flask F. It is the device of Mr. C. W. Proctor, of Lake Forrest, Illinois, and consists of a cylin-



dric cistern C connected to the barrel by a flexible pipe P. The cistern contains a float D, which rises with the liquid let into it from the barrel, and the float-stick marks the quantity in the cistern by a pointer on a scale S, as shown. A second pipe P' communicates with the cistern and is the outlet to the flask.

### The Electric Light and Plants.

The experiments of Sir William Siemens on the growth of fruits and vegetables under the rays of the electric light have been followed up recently with good effect on board the steamer *Atrato*, while proceeding to the West Indies. Mr. Morris, of Kew Gardens, was taking out cuttings of vines and Gambier plants to introduce their culture on some of the islands of the Spanish main; but the vessel encountered such cold weather that it was necessary to remove the plants from the deck into a sheltered position below. Here the darkness would have been as fatal to them as the cold, had it not been that Mr. Morris thought of supplying them with the electric light of the vessel.

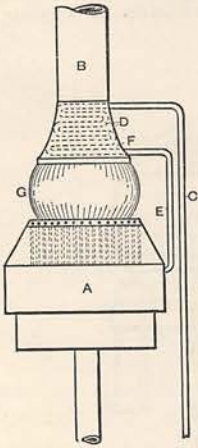
### The Kinetograph.

It has often been remarked that orators and actors have a fleeting fame inasmuch as their art dies with them, and cannot be reproduced or perpetuated. Mr. Edison is, however, about to remove this disability by his new invention of the kinetograph, which combines the phonograph and the zoetrope in such a way as to reproduce to the ear the words of a speaker, while his actions are presented to the eye. Instantaneous photographs, to the number of forty-six in a second, are taken by an automatic camera on a travelling film of sensitised gelatine, and these, after being developed, are projected on a screen by the calcium light in such a way as to give the impression of living action. The phonograph which contains the appropriate sounds is



caused to utter them at the right moment. Thus one can listen to a speech while looking at the animated picture of the speaker, or, to go further, witness the performance of a play or opera in one's own easy-chair.

#### A Lighthouse Gas-burner.



The new and powerful gas-burner designed for lighthouses and beacons by Mr. J. R. Wigham, the well-known gas engineer, is shown in our illustration. It acts on the regenerative principle—that is to say, the flame burns a gas which has been artificially heated by the warm products of combustion. In this way, the flame is not lowered in temperature, as it would be with cold gas, and the light is consequently more brilliant. Its brilliancy is further enhanced by enriching the gas with the vapour of solid naphthaline, which is placed in a copper holder, A, under the light. The flame, G, is of an ovoid or bulbous form, as shown in the engraving; and the products of combustion are led away by the chimney, B, which has a copper chamber, F, at its lower end. The gas going to the flame passes by the tubes, C D and E through this chamber, and is thereby heated before it absorbs the naphthaline in the chamber, A, on its route to the flame. In ordinary weather, the inventor proposes to employ 28 of these burners, but by means of a suitable arrangement of stop-cocks the number lit can be increased to 48, 68, 88, or 108 jets, according to the thickness of the atmosphere. It can be used with one kind of coal, Newcastle; the coke from the manufacture of the gas being utilised in heating the retorts.

#### Magnetic Divination.

Professors Rücker and Thorpe, in their magnetic survey of the South of England, discovered that the compass needle was attracted towards an axis or line running through South Wales and the Valley of the Thames to near Reading, and thence to Selsea Bill. This line, in fact, follows the geological axis of the Palæozoic rocks, which presumably contain iron or magnetic iron ore. A similar magnetic axis has now been found in France, passing by Fécamp, Elbœuf, Rambouillet, and Château-sur-Loire, which, if prolonged, would touch the English coast near Portsmouth. The rocks of this axis in France are calcareous and cretaceous, but Professor Rücker infers from the magnetic axis that under these sedimentary rocks the Palæozoic axis would be found uniting England to France across the Channel.

#### Cloud Pictures.

The beautiful photographs of clouds and the sky exhibited by A. W. Clayden, Fellow of the Meteorological Society, at the last *soirée* of the Royal Society,

were obtained by first photographing the reflection of the object in a mirror of black glass, placed in front of the camera so that the plane of its surface made the polarising angle with the axis of the lens.

#### A Wash for Greenhouses.

The following wash is recommended for greenhouse exteriors as one that will not wash off with rain during a summer:—Take 1 oz. of glue, and soak it a day before melting it in a pot. Dissolve  $\frac{1}{4}$  oz. of bichromate of potash (red alum) in water, and mix it with the glue and 1 lb. of ordinary whiting. Apply the wash in the usual way, stirring it constantly the while.

#### On the Use of Flowers.

Mrs. de Salis has, we believe, hitherto devoted her attention principally to cookery and the setting forth of dainty recipes. But dishes, be they never so cleverly contrived and daintily prepared, lack something if they are set upon a table that lacks or fails in decoration. So we welcome, and commend to the notice of all housekeepers, this author's "Floral Decorations *à la mode*" (Longmans). She does not by any means confine herself to table decorations, but she gives clever and practical hints for the right use of flowers, wherever and whenever they may be employed.

#### A Volume of Short Stories.

"The Hôtel d'Angleterre" is the title of a volume of short stories by the author of "Mademoiselle Ixe" which Mr. T. Fisher Unwin has added to his "Pseudonym Library." We prefer the first story, from which the volume takes its title, but the other four are all good—especially the last, "Miss Awdrey at Home." Decidedly this is a book to include in one's holiday luggage.

#### A History of Boston.

Boston has been called "the Cradle of the Revolution," which separated the American Colonies from Great Britain, and resulted in the establishment of the United States. It would probably be more correct to speak of Westminster as the cradle, bearing in mind the folly of George III.'s ministers. But Boston was the stage on which was played out the first act in the tragedy. So it has good claims to be included in Messrs. Longman's series of "Historic Towns," where its story has been well told by Mr. Henry Cabot Lodge. Englishmen might perhaps have felt inclined to doubt, on first thoughts, whether a city which was only founded in 1630 could be said to have a history, but our author has protected himself against criticism of that order by reminding us of the slender claims of our own oldest cities, when compared with the cities of Greece and Italy! And when he sets off London against the Temple of Bubastis, our lips are silenced and our pens stopped. Boston itself is venerable as a city compared with some of the cities of the Western States, and it has a splendid past and a glorious record to look back upon, all of which, in its gradual unfolding, is well presented by Mr. Lodge in the tasteful little volume before us.