

THE GATHERER:

AN ILLUSTRATED RECORD OF INVENTION, DISCOVERY, 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.

An Electric Coffee Heater.

The metal pot of which we give a general view and section in Figures 1 and 2 is intended to heat water or coffee by means of the electric current. For this purpose the bottom is made with a recess or hollow in it, and into this passes the electric heater, which is simply an ordinary incandescent lamp. The lamp, L, is mounted on a reflector, R, through which the wires, W, pass to the filament. A certain amount of light escapes below from the reflector, and is sufficient to enable the apparatus to be used at night time in a bedroom. Various lamps can be inserted in the bottom. Thus an 8-candle power or small size will keep the water hot, an ordinary 16-candle power one will boil it, and a 50-candle power one will rapidly boil it. The pot holds three-quarters of a pint, and the cost of boiling is given as only one-third of a penny.

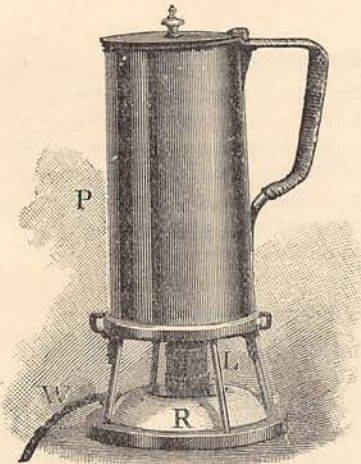
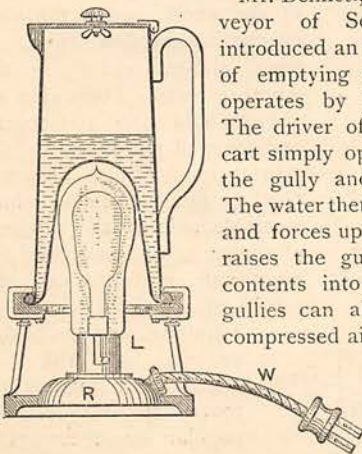


FIG. 1.

Various lamps can be inserted in the bottom. Thus an 8-candle power or small size will keep the water hot, an ordinary 16-candle power one will boil it, and a 50-candle power one will rapidly boil it. The pot holds three-quarters of a pint, and the cost of boiling is given as only one-third of a penny.

A Self-cleaning Street Gully.

Mr. Bennett, the Borough Surveyor of Southampton, has introduced an ingenious method of emptying street gullies. It operates by hydraulic power. The driver of the street mud-cart simply opens the grating of the gully and the water tap. The water then enters a cylinder and forces up a plunger, which raises the gully and tips the contents into the cart. The gullies can also be worked by compressed air

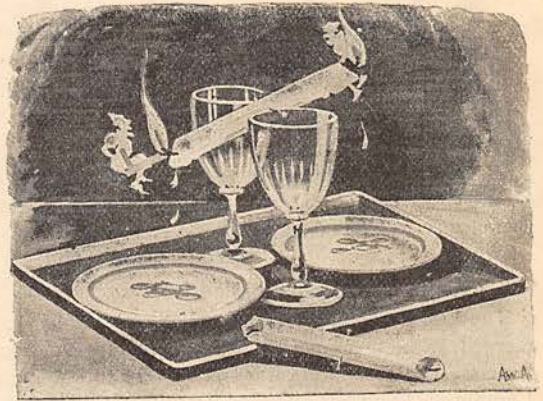


AN ELECTRIC COFFEE-HEATER.—FIG. 2.

A Candle Motor.

A French scientific journal draws attention

to a simple but ingenious, and withal instructive little toy motor which any father can make for the amusement of his children. It is shown in the accompanying woodcut, and consists of a stearine candle, supported between two wineglasses, with both ends lighted. To make it, first heat the heads of two pins and insert them in opposite sides of the middle of the candle, at right angles to it. These pins form the axis of the motor, and the candle is to be supported by them on



A CANDLE MOTOR.

the edges of the wineglasses. The ends of the candle are to be lighted and plates put under them to catch the drippings. A drop of stearine will fall from one end first and upset the equilibrium of the candle, making it turn. Very soon an oscillatory motion will be set up, which will only cease when the candle is blown out. The motion can even be utilised by connecting jumping-jacks of cardboard to the candle by thin iron wire or small pistons, after the manner of Watt's beam engine. The woodcut illustrates two cardboard figures enjoying a see-saw.

A Domestic Ozoniser.

Ozone, as is well known, can be readily made by electric discharges in the air, and the discharges from alternate currents are now employed for making it on a commercial scale. It is necessary to have sparking points a little apart from each other, and to connect these in circuit with the current. The sparks passing from one set of points to the other through the air-gap between them produce the ozone, which is a healthy disinfectant. The engraving shows an ozoniser or ozone maker for household use, which has been devised by M. Andreoli. It is shaped like a music stand, and

consists of a sheet of glass covered with tinfoil and having a series of toothed iron strips, *s*, above it. The



A DOMESTIC OZONISER.

strips and tinfoil are connected to the electric circuit by the wires *w, w*, and the discharge passes between them, thus producing the ozone.

A Torpedo Tell-Tale.

The torpedo boat, whether partially or totally submerged, is the insidious foe which our ports and fleets have most to dread, and it is satisfactory to know that Captain McEvoy has invented an automatic alarm for giving warning of their approach. This "watch dog of the sea," as it has been called, is named by its inventor, the "hydrophone," and consists of two parts, one submerged at the point of outlook, the other stationed on shore or on board ship. These two parts are connected by an electrical circuit, *L, L*, after the manner shown in the diagram. The sensitive organ is actuated by the waves of disturbance or vibrations coming through the water from the screw of the torpedo boat, or it may be the torpedo itself. It consists of an iron case shaped like a bell, and plunged mouth downwards to a depth of 40 or 50 feet, where it is anchored. The upper part of the inverted bell is, of course, occupied by air, and in this air space is fixed a copper box holding a delicate electric contact-maker, consisting of a platinum needle, *N*, resting its lower end on a platinum stud attached to the upper surface of a brass piece, *P*, fixed to the end of a horizontal spring, *S*. The vibration of the water set up by the propeller of the approaching vessel, causes the needle to dance on the stud and rapidly interrupt the electric circuit. It follows that the current from the battery, *B₁*, flowing through the line, *L, L*, and the shore indicator, becomes intermittent. This indicator, which is called the "kinescope," consists of an electro-magnet, *E, M*, with an oscillating armature, *A*, and when the intermittent

current passes through it, the armature swings to and fro until it comes into contact with a magnetised stop, *st*, which arrests and holds it. At the moment of contact the circuit of a local battery, *B₂*, is closed, and an electric bell is rung or an electric lamp is lighted to call the attention of the watch. Thus the propeller of the torpedo boat, or indeed any steamer, is made to announce the neighbourhood of the vessel, and it is obvious that messages could be exchanged between steamers at sea by the same contrivance, provided the propellers were stopped and started according to the Morse telegraphic code. The hydrophone is now being tried in the Solent by the Government authorities, and it is found capable of telling the passage of a vessel even a mile away.

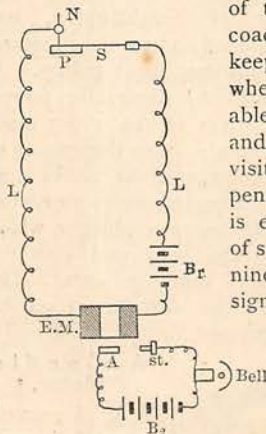
The Scotographoscope.

In a recent GATHERER we referred to the new device of Mr. Carus-Wilson for enabling a lecturer to exhibit drawings in a darkened room, and we may add that, according to the inventor, the translucent board on which the diagram is shown is made of a specially prepared glass, and backed with a substance which increases the diffusion of the light.

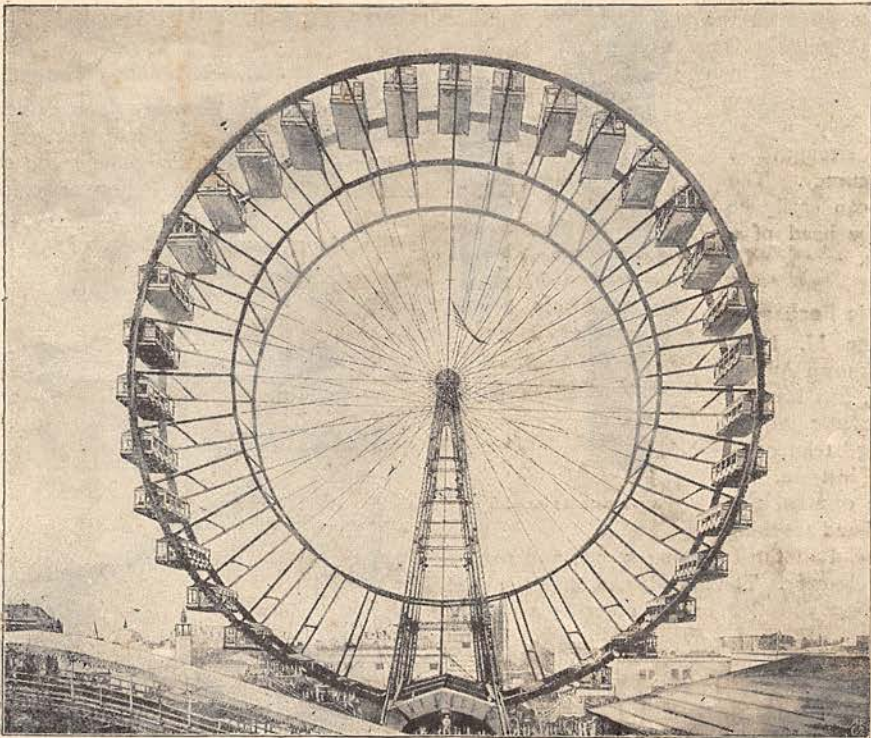
The Ferris Wheel.

Perhaps the chief wonder of the Chicago World's Fair is the great Ferris wheel, as the Eiffel Tower was that of the Paris Exposition of 1889. This enormous wheel is represented in our illustration, from which some idea of its size will be gathered by comparing it with the other buildings. It is 250 feet in diameter by 30 feet wide, and revolves between two skeleton towers as shown. Its general design is that of two bicycle wheels side by side, and connected by cross stays. It is built of steel and iron, but the bearings are of aluminium bronze, and each carries a load of 600 tons. The axle is one of the largest steel forgings ever made. It is 32 inches in diameter, 45 feet long, and weighs 56 tons. The steel for it alone cost £7,000. The axle is driven by cog-wheels gearing into endless driving chains which are actuated

by a steam engine. The rim of the wheel carries thirty-six coaches, suspended so as to keep always vertical as the wheel revolves. These cars are able to hold 2,100 passengers, and are well patronised by the visitors to the Fair. This stupendous merry-go-round, which is emblematic of the progress of science in the last half of the nineteenth century, was designed by Mr. G. W. Ferris, of Pittsburg, an iron-bridge engineer, and will, it is stated, be ultimately removed to one of the popular seaside resorts of the United States.



A TORPEDO TELL-TALE.

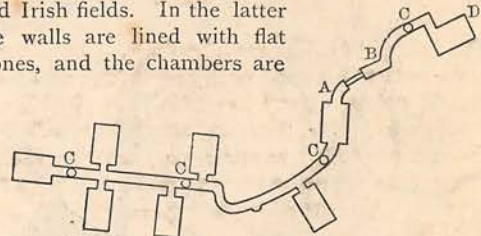


THE FERRIS WHEEL AT THE CHICAGO EXHIBITION.

A Gaulish Refuge.

Cæsar, Pliny, Tacitus, and other ancient authors, speak of underground residences in Gaul and parts of Germany which were used for storing grain or cattle, and as personal refuges in time of war. Several of these excavations have been discovered, and the figure is a plan of one found at Bretigny, near Chartres, France. The winding character of the gallery is part of the design, and the rectangular side chambers or cells were the store and living rooms. The gallery is on the average about 5 feet high and 3 feet wide. At A B there is a constriction in it for defensive purposes. A foeman entering the refuge at D is obliged to crawl like a snake through a narrow passage raised above the ground between A and B; so that a sentinel at A can cleave his head as soon as it appears. The air-vents, C, C, C, are round holes penetrating to the surface of the ground, and filled with loose stones. In general these refuges have underground wells or springs, and also fireplaces and benches cut in the soft rock or subsoil. Occasionally they are elaborate works built on a symmetrical plan, with main galleries branching from a common centre, and connecting galleries, so as to make a figure not unlike a gossamer web. Holes are also pierced through the walls at sharp angles, to enable the defenders to stab their enemies as they pass along. Such artificial caves—for the idea was probably taken from natural caves—

would be very cool in summer and snug in winter. They are similar to the "Picts' Houses" sometimes found in the subsoil of Scotch and Irish fields. In the latter the walls are lined with flat stones, and the chambers are



A GAULISH REFUGE.

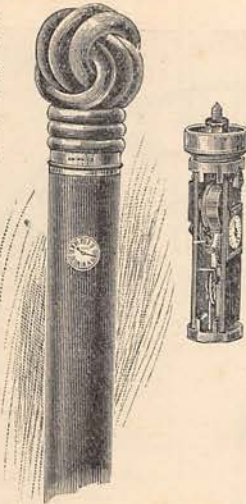
usually round, a form, however, which also occurs in the so-called "Gaulish Refuges."

A Clockwork Bell.

A handy bell for office doors, or those doors of private houses which are within easy reach of the occupants has recently been patented. The outside "push" is just like that of an electric bell, and the sound produced is very similar in both cases. The clockwork bell, however, requires no battery and will answer for some 150 calls before needing re-winding. As a "call" bell this clockwork device ought to be most successful.

An Umbrella Clock.

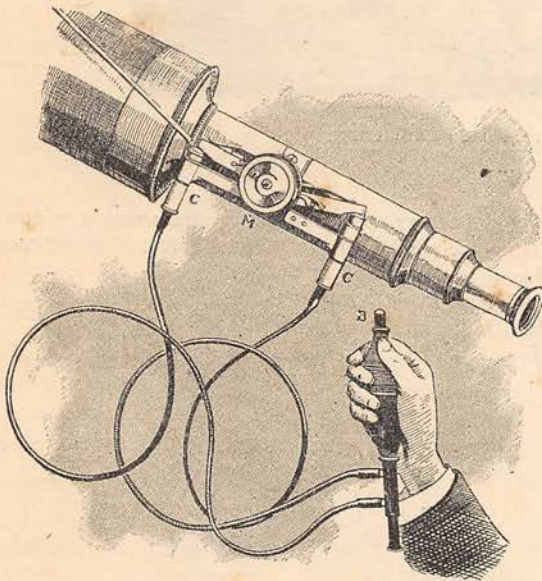
The figure represents a neat little timepiece for the handle of umbrellas. The dial is only half an inch across, while the clockwork is comparatively a large one, giving strength as well as accuracy. The same clock can easily be fitted into the head of a walking-stick.



AN UMBRELLA CLOCK.

A Pneumatic Focuser.

Mr. George M. Hopkins, a well-known American scientist, has brought out a pneumatic device for focussing telescopes, which we illustrate. It obviates the drawback of a trembling hand touching the milled head of the focussing screw, and can be fitted to any telescope. The milled head, M, in this case is turned in one direction or the other by a ratchet



A PNEUMATIC FOCUSER.

and paws, actuated by two air cylinders, C, C, containing pistons, and the operator has simply to compress and expand an elastic bulb, B, in the manner shown.

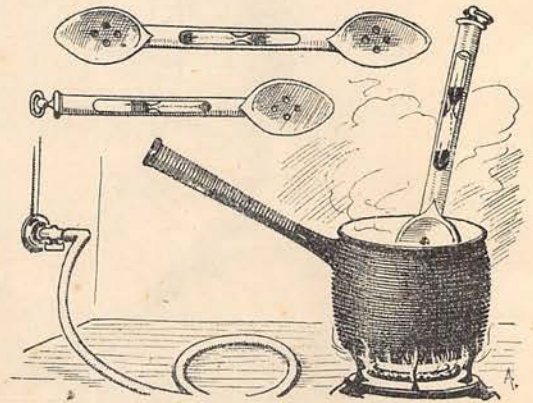
An Egg-boiling Spoon.

The spoon which we illustrate is designed for boiling eggs, and for this purpose has a sandglass in its stem, and holes in the bowl to allow the hot water to run out, and thus deposit the eggs in a dry state on the table. The spoon is allowed to stand in the saucepan, leaning on the edge as shown, while the eggs are

boiling, in order to allow the sand to run down. The form with double bowls is useful when more than one charge of eggs have to be cooked.

Two Household Novelties.

Two novelties of interest to housewives have lately been patented, and ought to prove very useful. The first is a slow combustion plate made of iron, which can be easily fixed to the bottom of register stoves by means of the screws provided. In this plate are sliding doors, worked by means of small levers, which can be regulated at will. When they are opened a strong and concentrated up-draught is obtained, which



AN EGG-BOILING SPOON.

will quickly produce a bright fire; but when closed no draught comes from beneath the stove, and the result is a steady and slow combustion. It is claimed that this slow combustion is not only most economical, but that a greater heat is obtained and diffused throughout the room. The second novelty is a "safe-boiling" stove mat, which is intended to be placed on the stove underneath the saucepan or kettle. When in use no food will burn on it, nor is any stirring required, and, what is an additional and valuable recommendation, coffee, milk, and other liquids will not boil over. It has been patented by a well-known firm, and is sold for a few pence.

Prize Competitions.

We hope to announce the result of three competitions which have recently been closed either next month or in our January number. These competitions are the Short Story Competition, the Cookery Recipe Competition, and the Holiday Competition, and in all cases the work of adjudication has already been begun.

Intending competitors are reminded that in the Three-Part Adventure Story Competition, November 1st is the latest date for receiving MSS.

A new series of Competitions will be announced immediately.