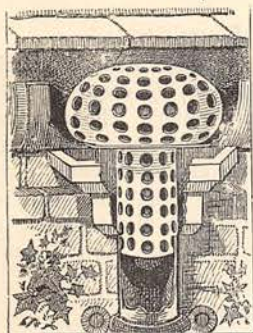


## THE GATHERER: AN ILLUSTRATED RECORD OF INVENTION AND DISCOVERY.

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 submitted.

### A Spout Protector.



Household spouts often get stopped up with leaves and sediment, hence the device which we illustrate herewith. It can be fitted to any spout or gutter, and, as shown, simply consists of a short perforated tube having a closed perforated head, inserted in the top of the spout to act as a strainer for the water. Projecting as it does above the top of the spout opening, the protector operates even when the gutter contains a layer of sediment.

### Tanning with Soap.

A method of tanning with soap, oil, and carbolic acid, is stated to have been brought out by an Australian inventor. The skins after being limed in the ordinary way are placed in a tin bath, consisting of a mixture of ten gallons of water in which 200 lbs. of soap are dissolved, and containing 1 gallon of carbolic acid. The skins are left in this until converted into leather. The process is said to be accelerated by adding a fresh pint of carbolic acid to the liquor from time to time. The above course is applicable to sole leather; but for a softer leather, limed and haired skins are kept for one or two days in a mixture of four parts of carbon bisulphide and one of carbolic acid, then washed.

### "Botanists'" Parasols.

A new invention has recently been introduced in France for the benefit of lady botanists. It consists of an ordinary parasol, with a small but strong pair of scissors concealed in the top of the stick. By touching a knob in the handle the scissors spring out, and by their means the owner can cut flowers, leaves, &c., growing far out of reach on high banks, thorny hedges, or overhanging boughs.

### A Large Electric Locomotive.

A full-sized electric locomotive has been built at Rhode Island. It is designed for traction on a railway of the ordinary gauge, and to draw a regular passenger train behind it. It has six wheels, each 5 feet 8 inches in diameter, and these are coupled direct to the armatures of two powerful electric motors. These armatures are no less than 3 feet in diameter, and they are capable of giving out a power of 500,000 watts, or about 670 horse-power. Electric head-lights

are fitted to the locomotive as well as electric bells, and brakes. The train is also to be lighted by incandescent lamps fed from the current, which is to be supplied to the motors from a generating station by a central conductor. In view of the proposed electric under-ground railway for New York this locomotive is a step in advance.

### A Nickel Lightning-Rod.

Copper is not a very good material for lightning-rods apart from its high conductivity for the electric discharge. It is, for example, comparatively dear, and it is also somewhat soft and easily cut. Iron, again, is liable to rust, although it is much cheaper than copper. It is interesting, therefore, to find that a nickel rod is being tried on a building in Dresden. Nickel does not rust in moist air, it conducts fairly well, and is tolerably strong.

### Out-door Bagatelle.

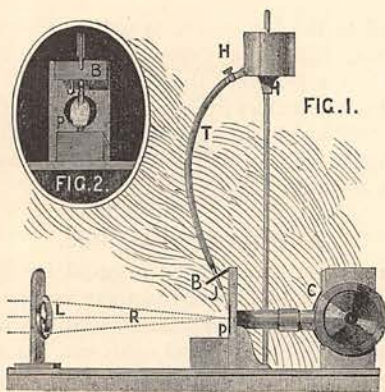
A match at bagatelle was recently played in Small Heath Park, Birmingham, under novel conditions. In place of the usual table an asphalt or concrete surface formed the field, and instead of cues, mallets were employed, or the balls simply bowled by hand. Lawn bagatelle may come to be a rival of lawn tennis if it meet with general favour.

### Photographing Sound.

Professor Graham Bell has, in conjunction with other inventors, brought out a means of registering sounds, including the human voice, by means of photographic plates. This is the apparatus called the "graphophone," to which we alluded in a recent GATHERER as having been patented in this country. Mr. Edison has found in the "phonograph" a purely mechanical means of recording and reproducing sound: Professor Bell has now devised a chemical, or photo-chemical, means. His method will be understood from Figs. 1 and 2; but we may preface the description of these figures with the remark that the essence of the plan consists in causing the vibrations of the voice to vary the *intensity* of a ray of light which falls on a moving sheet of sensitised photographic paper. The intensity of the ray, varying with the vibrations of the voice, decomposes the photographic film in proportion to its intensity: that is to say, the depth of its photo-chemical action on the plate corresponds to the intensity and to the vibrations of the voice. This is done by causing the ray to pass through a sheet of absorbent solution which varies in thickness according to the vibrations of the voice. The ray thus filtered varies in strength with the thickness of the solution, and thus with the vibrations of



the voice. In Fig. 1, R is the ray, concentrated by a lens, L, and passing through a pane of glass, P (Figs. 1 and 2), then along a tube to a camera, C, or dark chamber, containing the photographic plate, which is endowed with movement by means of an automatic mechanism. In passing through the pane, however,



the ray experiences a sifting because of a sheet of solution of bichromate of potash flowing on it from the jet J, the pipe T, and the holder H above. This sheet of orange liquid reduces the intensity of the ray in proportion to its thickness, and this thickness is regulated by the vibrations of the inclined speaking-board, B (Fig. 2), against which the operator speaks. Consequently the intensity of the ray is regulated by the voice, and hence the depth of the photographic impression in the camera. This impression is developed like an ordinary photograph, and the depth of the sound-trace is the phonographic record, just as the depth of the furrow in the tinfoil of Edison's phonograph is the register of the sounds. Professor Bell reproduces the sound by means of a microphone, battery, and telephone. The sound-trace is caused to agitate the loose contacts of a microphone, and thus to vary the current of the battery in accordance with its depth. The telephone responds to the varying current and reproduces the sounds.

#### A New Mode of Flame-Heating.

Mr. T. Fletcher, F.C.S., has been making experiments on the heating of water in kettles and boilers by means of flames, and we understand that his opinion is against the present plan of flat-bottomed kettles. He prefers a ribbed or flanged bottom to a boiler, as giving greater efficiency. A kettle of his device, which he shows to be more economical than the ordinary sort, has metal projections in the bottom which take up the heat from the flame and convey it to the water.

#### A Wax Phonograph.

A modification of Mr. Edison's well-known phonograph has recently been devised, in which a thin layer of wax takes the place of the tinfoil of Mr. Edison's instrument, and a knife-edge the stylus by which the wax is indented. The instrument is said to give good

results. It will be understood that the knife-edge is fixed to the back of a diaphragm, which is caused to vibrate by the voice, and the edge cuts into the wax. As the waxed surface is caused to move under the knife-edge the vibrations are imprinted into it in a track, which can be made to reproduce the speech by passing it once again under the knife-edge, and thus setting the diaphragm into vibration.

#### Branding by Electricity.

At Boston (U.S.) there is being made a voltaic battery for the purpose of supplying electricity for branding sheep at a ranch in Montana. The branding is to be done by a platinum wire rendered white-hot, or incandescent, by the passage of the current of electricity through it. As the wire is fine and can be raised to any desirable temperature, the branding is performed quickly and, it is said, with the minimum of pain.

#### India-rubber Ear Drums.

An artificial drum for the ear, of soft, flexible india-rubber, has been devised by an American inventor. The rubber membrane is stretched on a spring loop, which expands and holds it in position within the ear. A concealed cord is attached to the drum, whereby it can be removed at will by the person using it. A small hook also serves the same purpose. The invention thus appears to be a remarkably convenient one, since if the user desires to be hard of hearing in any particular case, it is only necessary for him to undo his drum!

#### A Chiming Dinner-Bell.

The figure illustrates an octave of bells which may be called a "parlour chime," and which can be used as a dinner call, or for amusement in bell-ringing. The



bells are fixed on a board as shown, and two drumsticks or beaters are provided for the player. A card of printed tunes is supplied with the bells, so arranged numerically that tunes can be played by a person ignorant of music.



### Telemaregraphs.

Fifteen stations have been fitted up along the Scheldt and its tributaries, between Ghent and Lille, for tidal observations. They are connected by telegraph to a central station, and the flow of the tide is there recorded every five or ten minutes by automatic means, on zinc plates. Copies of the record are printed from the plates for distribution and storage. While upon this subject we may mention that the old idea of fitting the Europe-American route for vessels across the Atlantic with floating stations anchored to the bottom has again cropped up in America. These stations would be lightships and telegraph offices combined, as well as refuges in case of wrecks.

### Dust Fuel.

An immense quantity of coal is reduced to dust, and any attempt to utilise the valuable waste deserves encouragement. A specially constructed furnace for burning coal-dust has recently been tried with success in London. This furnace is simple; the dust fuel being laid on deep narrow bars, which dip at their lower sides into water. The fuel is burned by air forced by a fan or blower into a closed ash-pit. These furnaces are adapted for bakers' ovens and laundries, as well as steam-engines. The cost of fuel for 1,000 gallons of water evaporated came out at from 4d. to 6d. in the experiments.

### Electric Police Signals.

A police signal or tell-tale has been fitted up in Boston. Its object is to enable policemen on duty to signify at the central station where they are upon their beat, and thus record their attention to duty. This device is, however, combined with a telegraph, by which the policeman can telegraph news or call for a fire-alarm, patrol waggon, or ambulance provided with medical appliances and men. Thus the event of an emergency is also provided for, as well as the concentration of police to the place from which the call has come. Such an arrangement must contribute to the peace and safety of a large city.

### Oil from Wood.

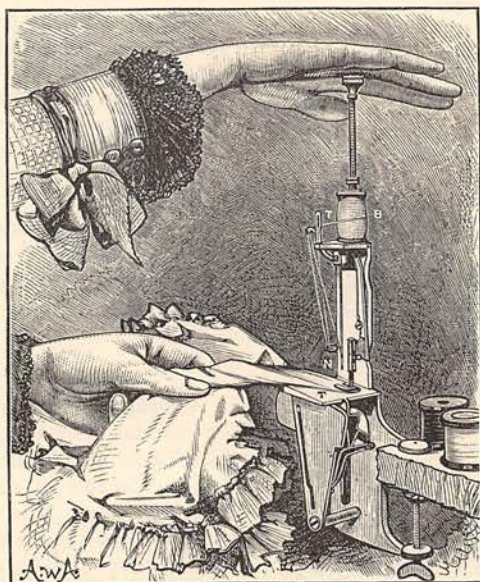
A new industry—namely, the extraction of oil from wood—has lately sprung up in Sweden. The oil is used for illuminating purposes in ordinary lamps, and

it is made from the stumps and roots of trees left in the forests after the timber has been cut. The trees which furnish most oil are the pine and the fir. Turpentine creosote, acetic acid, wood charcoal, tar oils, and so on, are also made from the stumps. The oil burns best when mixed with a proportion of benzine, as otherwise it is apt to be smoky from the large amount of carbon it contains.

### A Pocket Sewing Machine.

A little lockstitch sewing machine has been invented by a German, which, from its size—namely, eight

inches long by two inches wide—and its weight of eight ounces, may be considered a pocket machine. The apparatus resembles a hand stamping appliance, and can be fixed to the edge of an ordinary table by a clamp. The invention is very ingenious, and all that is necessary to work it is to press the head of a sliding bar at regular intervals. Ladies for the future will perhaps make it an accompaniment of their friendly visits to each other. The figure represents the machine in its entirety, and will be sufficiently understood by those who are accustomed to such machines, without any detailed description of ours. The bobbin, B, is seen above with the thread, T, leaving



A POCKET SEWING MACHINE.

ing it and proceeding to the needle, N, which works through the small table, T. All the other parts are accessory to the working of the tool and the fixing of it in position. The construction is simple, and it is said that a mere child—or, at all events, a very young person—can learn its use in a few minutes.

### Numbness from Lightning.

A curious case has been reported recently by a Scotch physician, of a lady who was struck, or rather stunned, by lightning forty-two years ago, and has retained a numbness from it ever since. The lightning knocked her over, and on regaining consciousness she felt a numb sensation in the right side and arm, but no other ill effects, and no external marks were visible. Ever since she has felt this numbness increase on the approach of a thunderstorm, and she can tell by it when the air is heavily charged with electricity. Otherwise she is hale and hearty, and has a considerable family, all of whom are well and strong.

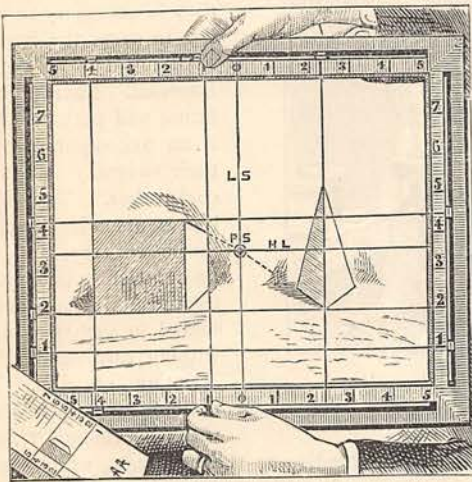


### The Krotophone.

The "krotophone" is a new telephone receiver which has no magnetism or wires in it, but which appears to be a modification of the Hughes carbon microphone. The microphone is known to have the property of giving out sound when traversed by a current, as well as acting as a transmitter of sound; but the inventor of the "krotophone" appears to have improved the receiving microphone. His apparatus consists simply of a carbon pencil pointed to a round carbon disc, which acts as a diaphragm. The pencil touches the disc, and when the telephone currents pass through the pencil to the disc, and thus to the edges of the latter, it gives out the sounds, or, in other words, it reproduces the speech.

### A New Drawing-Frame.

A correspondent sends us the following sketch of an ingenious drawing-frame, which enables a learner or amateur to draw from natural objects with more accuracy than with the unaided eye. It consists of a



rectangular frame, as shown in the figure, each side having a slit cut in it. Spring holdfasts are inserted in the slits and can be moved to and fro by the finger and thumb, each holdfast remaining where it is left when the force is removed. Threads crossing the frame between the holdfasts are thus moved so as to give the perspective height or breadth of any distant object in the field of view. Thus, by moving two or more threads at right angles the perspective position of a square block or other similar figure can be marked as shown. The frame is graduated for the purpose of transferring the intersections to the drawing-paper, which should have its edges divided in the same proportion as the frame.

### The King-Fish.

An opah, or king-fish (*Zeus luna*), was recently captured off the Shetland Islands and brought to the Colonial and Indian Exhibition. The specimen is

about five feet long and weighs 160 lbs. This fish is exceedingly rare, and of great beauty. The colours of the sides and back are dark green intermingled with gold and purple, while the irides are red. The opah appears to be a roaming fish, and is found in most places of the world from time to time. Its habits are little known, and its fare is believed to vary with the locality it finds itself in. When visiting the British Islands it is believed to feed chiefly on herrings and cuttlefish.

### Preserving Fish.

A Hamburg inventor has brought out a process for preserving fresh fish. It consists in putting the fish as soon as caught into steel barrels filled with a solution of boracic acid, tartaric acid, and salt and water; the proportions being three per cent. of the antiseptics, and ninety-seven per cent. of the salt water. An air-tight cover is then put on the barrel, and by means of a valve in it the water is pumped into the barrel, whilst at the same time the air is expelled. This done, the barrel is ready for transport. The process has been tried in this country on the salmon caught in Scotland and brought to London, with satisfactory results. The casks hold about 300 lbs., and it is stated that the fish keeps fresh in them for several days. The process is equally applicable to the preservation of jointed meat.

### A Great Balloon.

A voyage across the American continent is about to be undertaken by a San Francisco aeronaut, Mr. A. P. Van Tassel, and for that purpose he has constructed a balloon capable of containing 150,000 cubic feet of hydrogen gas. The height from the floor of the wicker car to the top of the gas reservoir is 119 feet. The envelope is made of fine cloth, varnished to make it air-tight. The car can contain fifteen persons, and is 21 feet round, while its sides are 34 inches high. Mr. Van Tassel has had considerable experience in aerial travelling, he having crossed the Wichita Mountains, which rise 15,000 feet above the sea-level. The winds blowing eastward from the Pacific towards the Atlantic are the agents on which he relies for the success of his experiment.

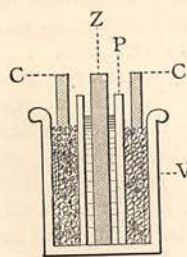
### Two Curious Pens.

A pen, heated either by gas or an electric current, is now used to trace designs on waxed glass, with a view to engraving the glass. The hot point causes the wax to flow off the glass, leaving it bare to the fluoric acid used in etching the glass. While upon this subject, we may also mention that an ingenious Frenchman has designed a double-nibbed pen, by which a duplicate copy of a letter or other writing is obtained. The two pen-points—or, rather, separate nibs—are placed one over the other on the butt end of the holder, the distance separating them being the width of the two lines—namely, the original and duplicate—of the writing; and the two sheets of paper are so arranged on the desk provided, that it is easy after writing a line to shift the papers so as to make ready for writing another line.



### A Chlorine Gas Battery.

A new battery for electric lighting in houses has recently been devised, which does not require to have its solutions replaced when exhausted, inasmuch as the action of the battery is kept up by a continual circulation of chlorine gas. Each cell consists of an outer vessel, *v*, which may be of earthenware, and this contains a pot or chamber of porous clay, *p*. A zinc plate, *z*, is placed in a dilute solution of chloride of zinc in the porous compartment, the zinc being well amalgamated with mercury first. The outer space between the porous pot and the external vessel is filled with



pieces of carbon and sulphur, in contact with which is a carbon plate, *c c*. Chlorine gas is allowed to circulate through the loose packing of carbon from the bottom of the cell upward. Tubes convey the gas from a reservoir or holder to the bottom of each cell, and it passes from that cell to the next through a pipe leading from the closed cover of the cell. In this

way the gas traverses the outer compartments of the entire battery of cells. Any of the solution round the zinc which percolates through the porous pot into the carbon compartment is drawn off from time to time by a stop-cock, and it is necessary to add a little water from time to time to supply the loss of liquid. Twenty of these cells joined up like an ordinary battery maintain a small installation of electric incandescent lamps so long as the zinc lasts and the gas and water are supplied.

### A Large Kettle.

A St. Louis firm is building a copper steam-kettle for a firm of brewers, which will require from 7,000 to 8,000 pounds of copper for its construction.

### Glass Bearings.

Bearings of glass for machinery, and intended to have very little friction, are now made in this country. They are grooved so as to keep the lubricating oil in circulation, and a current of air is also allowed to pass through them to cool them. They are said to wear longer than metal bearings, and to require much less lubricator.

### Recent Photography.

Flames are now used to measure the pitch of sounds by photography. It is well known that when what are called "sensitive flames" are influenced by a musical note the flame responds by bobbing up and down, a rise to every vibration. By means of revolving mirrors the image of the flame at successive moments can be seen, and the responsive vibrations of the flame spread out as it were. On counting the number of these in a given time the pitch can be determined. For mirrors there are now substituted moving photographic plates, and the vibrations of the flame are thus permanently fixed, for future reference. The method is said to be

very accurate, and likely to supplant the older method with mirrors. Instantaneous photography has also been applied recently to the production of photographs of ships in motion at different speeds, so that naval architects can study the movements of the vessel, the throw of the water, and the positions of the waves. Some very perfect balloon photographs have also been obtained recently by a well-known Parisian photographer. Some of the views were obtained at a height of over 1,000 metres, and on being developed were found to reveal the details of buildings on the surface below with remarkable fidelity.

### Laying Dust in Mines.

A well-known mining engineer has brought into notice the successful use of watering the floors of deep mines to allay the dust, and thus prevent explosions. A slight dampness, such as prevails in shallow mines at all times, is, in his words, sufficient to lay the dust effectively; and the systematic watering of deep mines has been introduced at the Llwynfria Colliery and at the Standard Colliery. The water can either be brought into the galleries by tanks or by pipes from a reservoir above ground. A pressure of fifty pounds to the square inch is considered sufficient at the Standard Colliery. The water not only purifies the air, but robs it of the inflammable coal-dust which is so dangerous a factor in great explosions. While upon this subject we may refer to a recent suggestion as to the cause of fires in flour-mills. It is known that the fine meal floating in the air of the mill, like the coal-dust in a mine, tends to enhance the explosion; but M. Boher, the Inspector of Lighting in Dresden, finds that the belts of machinery sometimes give off electric sparks sufficiently strong to illuminate Geissler tubes, and he thinks that they may also account for the explosions in some mills.

### A Pocket Drinking-Cup.

The figures illustrate a drinking-cup for tourists and travellers, which packs up into a watch-case as shown.



The cup itself is made of loose rings, which slide into shape and out of shape by an easy pressure. The material is harmless, being aluminium-gold or nickel, and it has a pretty appearance. The outside of the case is finished like a watch, and resembles one.



### Electricity and Ensilage.

At Hatfield, the seat of Lord Salisbury, electric power was employed during the summer to cut green fodder before storing it into "silos," and also to lift it in the process. The power was derived from a water-wheel on the river Lea about a mile distant from the scene of the operations. Here a "16-light" dynamo, turned by the water-wheel, generated a current of electricity which was conveyed by wire to a second dynamo specially wound to act as a motor when traversed by the currents in question. This motor worked the elevator and the chaff-cutter which were used. Electric power has also been employed at Hatfield in other farming jobs.

### A Smoke-Burning Furnace.

A new smoke-consuming furnace has recently been brought out, and successfully tried on the Thames tug *Alexandra* before members of the National Smoke Abatement Institution. The device can be applied to any furnace, and consists of a series of hollow bars so fixed as to allow of an intimate mixture of air with the smoke. As applied to the *Alexandra* the bars are said to have been remarkably successful, the funnel of the tug showing no smoke.

The saving of coal is also expected to be considerable, as the heat given out by the burnt smoke goes to help that of the burning coal. The invention is a simple one, and we trust it will prove of service.

### Spiral Lightning.

A French *savant*, M. Ch. Mousette, in his laboratory at Auteuil, Paris, on the evening of May 12th last, about 9.45 p.m., succeeded in photographing flashes of lightning, which, on inspection, proved to be spiral flashes: that is to say, the lightning in its passage between the cloud and earth described a more or less irregular spiral path. In the case of two flashes separated by an interval of some minutes, and photographed on the same plate, the direction or lay of the spirals was opposite, one being left and the other right-handed. The distance between the spirals or turns was sometimes less than a diameter of the spiral and sometimes several diameters—an irregularity

which M. Mousette attributes to differences in the conductivity of the air for electricity. After the experiments of M. Planté on globular lightning, M. Mousette thinks that these spiral flashes may be due to this phenomenon moving in a gyratory course.

### A Tennis Indicator.

The engraving shows a new tennis scorer and signaller, which is worked by turning a small handle, and scores for either or both sides in points from fifteen to advantage, in games from one to six, and in sets from one to any necessary number. It also scores back to deuce points and deuce games; at each game one bell rings, and at each set two bells ring. The small flags above show the colours of the players. The size is such that the state of the game can be seen from any corner of the lawn. It is fixed on a portable iron stand in any convenient part of the lawn.



A TENNIS INDICATOR.

### A New Hand-Grenade.

A new hand-grenade for extinguishing fires has been introduced into this country from America. The novelty in the grenade is in the vent applied to the bottle containing the extinguishing liquid, and this vent allows of the escape of the gases in the liquid, so as to prevent explosion in a dwelling, and to allow of a thinner glass being used for the containing bottle. The use of thin glass insures that the grenade will burst when thrown at a fire. Trials were recently made with the new grenade on the Thames Embankment, and the results were satisfactory.

### PRIZE COMPETITIONS.

The Editor hopes to announce in an early Number the Award in Competition No. 4 (Dress Allowance). Intending Competitors in Competition No. 2 (Thirty-five Pound Prize Story Competition) are reminded that November 1st is the latest date for receiving MSS. Full particulars of these and other Competitions, open to all readers of the Magazine, will be found in the June (1886) Number.