

## 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 Sleeveless Waterproof.

Our illustration shows a new form of waterproof for ladies, which is finding favour. The improvement over ordinary ones is that the arms can be used without sleeves, while they can also be protected from the wet in walking by withdrawing them under the cape portion, as will be understood from the figure.

### Rail Foundations.

Steel rails laid in cement are now used in America for the foundations of houses. The cement is expected to protect them from rusting by exclusion of the air, and because of the solid foundation thus obtained, the pillars of the building may be made lighter.

### A Bore-Hole Camera.

On the 23rd of October, 1885, some workmen were entombed in a quarry at Chancelade near Périgueux, and it being proposed to investigate the gallery in which they were buried, M. Langlois, a Parisian photographer, designed a photographic apparatus which could be let down a bore-hole reaching to the gallery, and which would photograph the latter when lighted by electric incandescent lamps, also sunk into the mine. His apparatus is a good solution of the problem, and consists of a cylindrical case, which screws into the boring-rod, and which, by a chain ascending the interior of the hollow rod, allows of a small narrow camera being pulled out of its resting position in the hollow of the rod, and directed to the gallery for the purpose of photographing. Above and below this camera and its case are a row of electric incandescent lamps, which are also protected by the hollow tube on one side, but exposed on the same side as the objective lens of the camera. The result is that the electric current is sent down the wires which pass up the hollow rod, and there is a flood of light above and below the camera, which enables the latter to picture the lighted mine. The photographs taken showed the *débris* and walls of the gallery, with broken timber and a wheel, as well as the head of one of the unfortunate miners. Doubtless this new appliance, or others like it, will be brought into use for underground work.

While upon this subject we may also mention that Doctor Boudet of Paris has succeeded in taking photographs without a camera, and by the light of the electric spark or an ordinary Carcel oil lamp. On a mirror is placed a glass plate, sensitised by gelatine-bromide and having the sensitive surface uppermost. On this surface the design to be copied is laid face downwards and a sheet of tinfoil put over it. A glass plate is laid over that, and the whole is exposed by hand to the light of the lamp, in such a way that the rays are reflected from the surface of the mirror upon the sensitised surface. The result is a photograph of the design, which, when developed, is fairly well defined.

### Tracing a Leaky Pipe.

The microphone has been ingeniously applied by Mr. Leubel, of Canton, Ohio, U.S., to the finding of a leak in a pipe or water conduit buried about six feet under the ground. The pipe was closed at the outlet end, so that the water was practically still within it, except at the point of leakage, where a slight noise was made by the water draining into the sandy soil around. On traversing the line of the conduit above ground with the microphone this noise was detected and the spot of leakage found. The apparatus used is shown in the accompanying figure, where B is the voltaic battery with its poles connected through a carbon microphone, *b*, mounted on a wooden box, R, and through the primary wire of an induction coil, I. The secondary wire of the induction coil is connected through a Bell telephone, T. The box, R, is of wood, open below. The microphone consists of several pencils of carbon, *g, g, g, g*, resting with their points



on a carbon plate fitted on the wooden top of the box. A rushing noise in the telephone, which became fainter as the observer moved away, told where the true point of leakage was situated.

### Protecting Small Gas-Flames.

A new gas-light regulator has recently been patented which is intended to guard small flames from draught, and to economise the consumption of gas where it is necessary always to have a light instantly available. A glance at our illustration will show the construction



of the apparatus, which is attached to the globe-holder of the gas bracket. The supply of gas, being admitted by the bracket stop-cock, is regulated by that of the apparatus, and to this latter stop-cock is attached a bent arm, by which a tiny mica lantern is raised or lowered, as the supply of gas to the burner is lessened or increased. In using the apparatus it is only necessary to leave the bracket tap turned to such a point that the gas supplied to the burner is sufficient to give the full light required; then on turning the tap of the regulating apparatus to admit this gas to the burner, the mica lantern falls below the top of the burner. But when the full light is no longer required, and all that is necessary is a rush-light, the tap is again turned and reduces the gas supply, at the same time raising the lantern till its transparent, incombustible sides surround the tiny flame, and thus guard it against draughts. Of course, with this apparatus a much smaller flame may be left, without danger of its being blown out and the gas escaping, than would be safe with an unprotected burner.

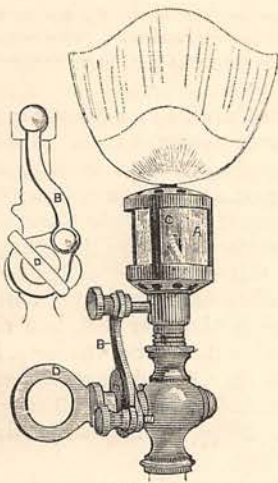
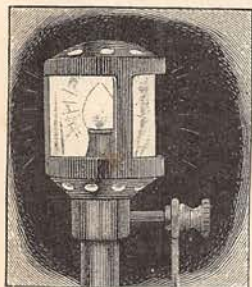


FIG. 1.

#### An "In" or "Out" Indicator.

An ingenious electrical arrangement has been brought out, by which a person calling at a house or office can ascertain whether the individual he wishes to see is "in" or "out" without ascending the stairs or troubling the servants. He has simply to press a button like the ordinary electric bell, and the answer is signalled back to him. When we say that the name or names of individuals to be seen are arranged on the indicator front, with appropriate signal discs properly marked, and that these discs, in answer to his call, are worked by electro-magnets so as to tell him whether the person can be seen or not, we have said enough to explain the apparatus,



PROTECTING SMALL GAS-FLAMES.—FIG. 2.

which is simply an adaptation of the usual electric indicators, such as are used on railways and elsewhere.

#### An Antiseptic Vessel.

Professor Tyndall has shown that, in order to prevent a liquid fermenting, the air reaching it should

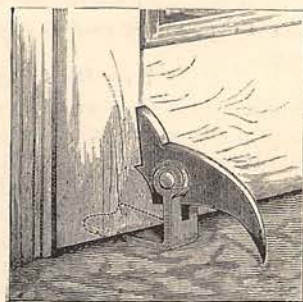
be free from dust and organic germs. Hence M. Schribaux has designed an antiseptic vessel for holding soups, milk, or other organic liquids. It consists of a cylindrical can with a tight-fitting cover made hollow and sinuous. The under-side is pierced with small holes, and the whole is arranged not to prevent air getting to the liquid, but to cause the dust and germs in it to deposit on the sinuosities of the cover before it gets to the liquid. It is necessary, however, that the liquid be boiling when the cover is put on, otherwise the other precautions are said to be useless. The subject is well worthy the attention of inventors.

#### Electricity and Fodder.

Experiments have recently been made in Germany to test the influence of electricity in promoting the growth of plants. Plates of copper and zinc were buried in the ground about 100 feet distant and connected by wire above ground, so as to form with the moist earth a voltaic battery, such as has been used by Bain for working electric clocks. Potatoes and beet were planted between the plates, and the arrangement is said to have given an increased yield of 25 per cent. in the one case and 15 per cent. in the other. Of course, the results were compared with the yield in other parts of the field where the earth battery was not acting.

#### A Door Fastener.

The device here figured is a very simple and useful contrivance for fastening a door within so that it cannot be opened from without, although the handle and lock would admit of it. It is simply a beak-shaped and hinged piece of metal, which is slipped under the door. The beak is pressed down with the hand or foot, and the door, catching it, cannot be opened.

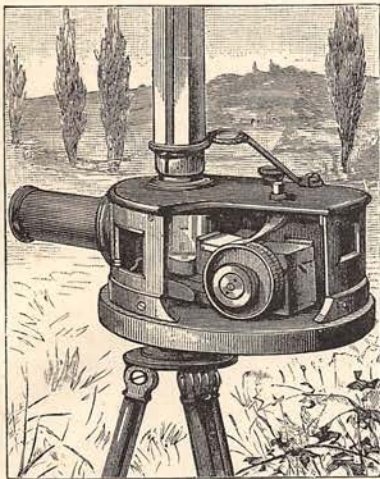


#### Tests for Water.

The following simple tests for water have been recently given:—(1) For hard or soft water. Dissolve a small quantity of good soap in alcohol, and let a few drops of the solution fall into a glass of water. If the latter turns milky, it is hard; if not, it is soft. (2) For earthy matters or alkali. Take some litmus-paper dipped in vinegar, and if on immersion in the water the paper returns to its true shade, the water does not contain alkali or earthy matters. A few drops of syrup added to water containing earthy matter will turn it green. (3) For carbonic acid. Take equal parts of the water and clear lime-water, mix them, and if carbonic acid is present, there will be a precipitate, which will effervesce if a few drops of muriatic acid be added to it. (4) For magnesia. Boil the water to one-twentieth part of its weight, then drop a few grains of neutral



carbonate of ammonia into a glass of it, with a few drops of phosphate of soda. If magnesia be present it will fall to the bottom. (5) For iron. Boil a little nut-gall and add it to the water, which will turn grey or slate-black if iron is present. A little prussiate of potash will also turn the iron blue. (6) For lime. Into a glass of the water put two drops of oxalic acid, and blow upon it. If it gets milky, lime is present. (7) For acid. If litmus-paper turns red in the water, it contains acid; the lime test will show whether it is carbonic acid. If it turns a blue sugar-paper red, it is a mineral acid.



The Omni-telemeter.

The omni-telemeter is an ingenious instrument produced by Mr. W. Dredge and Mr. J. H. Steward. It has for its object the measurement of distances in military or surveying operations by means of sight, without actually traversing the distance. All such instruments work by triangulation, and are based on the laws of trigonometry; but the one in question does not necessitate the measurement of a right angle, which is considered an advantage, and among other improvements claimed for it is the useful one of being able to find the distance of moving objects. In some circumstances this function will prove very important. We need hardly enter into the details of the apparatus, or explain its mathematical principles, but we may mention that the distance is found by two sights, taken at the extremities of a short base-line—say 50 or 100 yards. The sights are taken by looking at a mark, and bringing the image of the object to align with the mark, by means of a mirror in the apparatus. A table gives the range or distance, which corresponds to the reading given by the instrument. There are other ways of using the appliance, which appears to be very serviceable and complete.

**Ice from Natural Gas.**

A curious result of the cold caused by the expansion of escaping gases has lately been observed in the gas wells of Western Pennsylvania, U.S. Again and

again, in boring into the gas wells, the driller has been impeded in his operations by the ice suddenly formed on the escape of the imprisoned gases, not only by the water or water vapour in the boring, but by solid paraffin formed from the oil in the working becoming frozen. Sometimes the tools are frozen into the passage. It has long been known that the expansion of gases under pressure causes heat to become "latent," and that the compression of gases is attended by a rise of temperature.

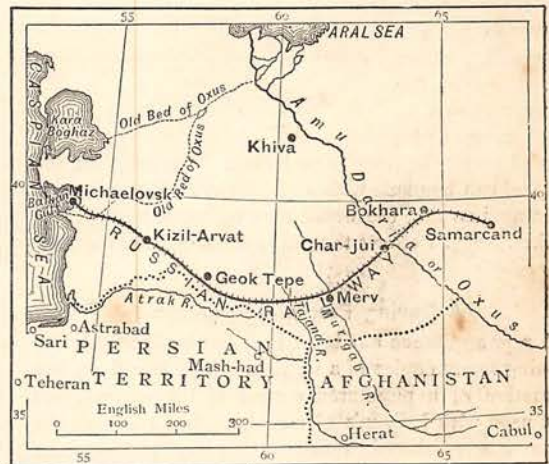
**A New Hair-Pin.**

The figure illustrates a hair-pin which has been brought out recently. It is provided with a second ball which slides on the stem or pin, and holds the hair, thus serving instead of other pins.



**An Important New Railroad.**

The Transcaspian Railway, which will ere long be finished between the Caspian Sea and Samarcand, will attract the attention of the public in England. The line was completed as far as Merv in July last. On the 1st of October it was carried a stage farther east to Charjui on the Amu Daria or Oxus, and it is contemplated to continue it to Samarcand as indicated on the accompanying plan. The course of the line too will be perceived clinging to the most strategic points, and opening up the communication with the frontiers of Persia and Afghanistan. General



Skoboleff, whose exploits in Central Asia will be remembered, was the author of this scheme. The "navvies," as we should call them, had a railway dwelling provided for them—houses on wheels—with not only living and sleeping rooms, but with a church and library "cars," hospital, and mess-rooms for officers. The line connects with the Amu Daria at



Charjui, and the river is destined to become an important feeder and means of communication. Small steamers burning liquid fuel will be introduced; the country near it is fertile, and, now that the great desert can be crossed by rail in twelve hours instead of, as formerly, in thirty hours, communications will be opened up rapidly. The whole length of the line will be 1,000 miles to the boundary of Afghanistan, within 500 miles of Peshawur. This steady progress towards British India, through desert places, cannot fail to demand some attention, if only as a means of transporting merchandise through Central Asia.

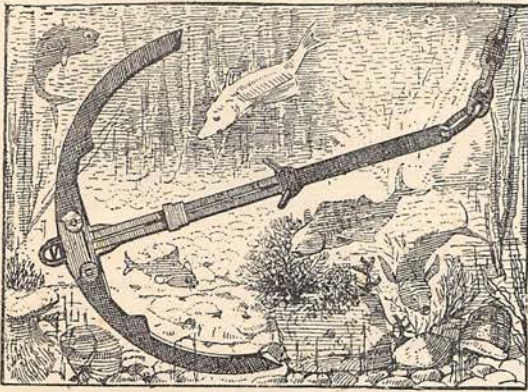


FIG. 1.

#### A Folding Grapnel.

The figures illustrate a new form of grapnel, in which the prongs are hinged so as to fold up when the appliance is not required. The advantage is obvious, as the sharp points of grapnels on boats and canoes are often an inconvenience. The grapnel, when folded up in the manner shown in Fig. 2, can be stowed under the floor in a locker. For canoists, the grapnel can be made with a sliding stem, which can be shortened so that the whole may be carried in a coat-pocket. Fig. 1 shows the grapnel opened out for use.

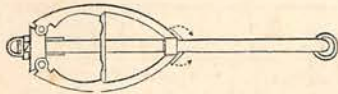


FIG. 2.

#### A Spring Pen Lithographer.

A new appliance has been brought out recently for making many copies of a writing. It is based on the formation of a punctured stencil of the writing, like that used with Edison's electric pen, but the perforations are produced mechanically by placing the stencil-paper on a fretted glass surface. When the stencil-paper is written upon by a steel-pointed spring stylus of special design, the fine points of the glass pierce the paper and make the stencil lines corresponding to the writing. The stencil thus obtained is used with a roller and printer's ink as in the older apparatus. The printing of the copies can be commenced in less than two minutes after the writing is finished.

#### A New Window-Cleaner.

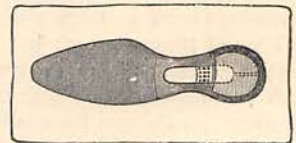
A new window-cleaner, which, in use, imparts a high lustre to the glass, has recently been patented in this country. It consists of a pad of loosely-woven fabric, provided with a wooden handle for applying it to the window-panes, and an elastic band round the top of the pad which serves to keep the composition to the bottom of the pad as it is used. On touching the glass lightly here and there with the apparatus, a small quantity of the powder contained in the pad is deposited on the surface, and on rubbing this with a smooth, dry cloth, a speedy brightness is the result. The composition is perfectly harmless on all kinds of glass, and is said to be equally applicable to all.

#### Cocoa Palms and Lightning.

Sir Emerson Tennant and others have noticed that the cocoa-nut palm acts as a conductor of lightning, hundreds in a single plantation being struck during the thunderstorms of Ceylon. A recent observer of the fact, in referring to the peculiar sensitiveness of this tree to lightning, asks why it is that, though the tree is apparently but slightly injured by the discharge, it ultimately withers and dies. The reason is probably to be found in the nature of the tree. Deciduous trees are most conductive outside, where the soft bark and sap are: hence the discharge probably passes chiefly by the outside. On the other hand, palms have a horny bark, and a more or less soft, spongy heart. Whatever the cause, the fact is interesting, and it may also be remarked that the sharp stiletto blades of the cocoa frond will act like the discharging points of a lightning-rod.

#### A Boot Ventilator.

Our figure illustrates a small ventilator, which is fitted into the inside of boots in the position shown, and designed to admit fresh air to the foot while excluding water. The air is admitted by means of a small shaft, which can be opened or closed at the will of the wearer. This shaft is shown by dotted lines running up the heel of the boot.



#### Casting Glass.

Mr. F. Siemens, of Dresden, the well-known glass manufacturer, has, it is stated, found a way of casting glass like iron or other cast metal. Its transparency enables flaws to be detected, which cannot be easily done in cast metal, and its hardness is such that experiments are being made to test whether it cannot be used for rails.

#### NOTICE.

*A New Serial Story, by the Author of "The Probation of Dorothy Travers," will appear next month; and the Prize Serial Story, "A Step in the Dark," will be commenced in the same issue.*