

"Poor Chorlton, his grief was painful to witness!"

"How sad!" I said, here interrupting the old Alpine guide. "And so Lockwood was dead?"

"Nay," replied Inkinsfell, "else I would not be here. Lockwood recovered, and is now doing a thriving practice not twenty miles from where we are now seated."

"And your daughter is, of course——"

"Mrs. Lockwood. Yes, you are right; and, if you choose, we will go together and see them some day."

"I shall be delighted," I replied.

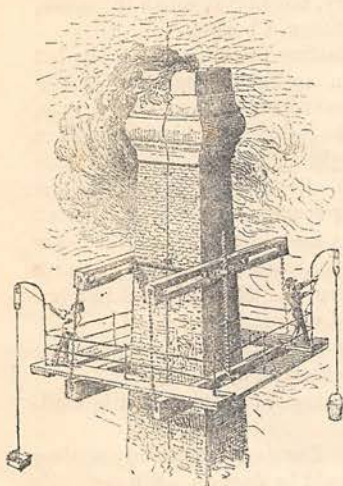
I took the old man's arm and together we left the breezy moorland, and were soon well on our way to Warsdene.

## THE GATHERER.

AN ILLUSTRATED RECORD OF INVENTION AND DISCOVERY.\*

### A Chimney Climber.

The engraving illustrates a machine for climbing tall chimneys, which has been used on a chimney of some alkali works at Liverpool. It consists of two stout grippers of wood, capable of being fastened to the chimney by two long bolts, one on each side of the chimney. From these grippers, two similar grippers, also bolted to the chimney, are suspended by means of four chains; and these lower grippers carry the staging as shown in our engraving.



The upper and lower grippers are also connected by two steel screws, which are operated to raise the staging higher. For this purpose the upper grippers are kept fast and the lower slackened, until the new position is reached, when they are again bolted tight to the chimney. This supports the platform and allows the upper grippers to be next raised to a fresh position as the length of the chains and screws permits. The device is calculated to save time hitherto lost in repairing chimneys by the methods of "Steeple Jacks."

### Lighthouse Illumination.

According to the report of the Experimental Committee on Lighthouse Illumination which has now been published, the electric light is considered by the Committee the most powerful under all conditions of

weather, and to have the greatest penetrative power in fogs. For lighthouse illumination with gas they also find that the Douglass patent gas-burner is much more efficient and economical than the Wigham burner, and that for the ordinary necessities of lighthouse illumination mineral oil is the most suitable and economical illuminant. For salient headlands, important landfalls, and places where a very powerful light is required, electricity offers the best advantages. Oil requires no gas-works at the lighthouse; and, as in the case of electricity, the heat generated by its combustion is less than that of gas.

### An Electric Vessel.

The *Volta*, a vessel of steel 36 ft. long by 7 ft. beam, and 3 ft. 6 ins. deep, propelled by electric power, and fitted with two masts with sails in addition, was launched on the 31st August at Greenwich. The screw-propeller is driven by two Reckenzaum motors arranged on a line with the keel, and placed under the floor. Seventy accumulators furnish the current, and will propel the vessel about forty miles with one charge of electricity. The cells are placed low down in the bottom of the boat so as to ballast her. The masts and sails are removable at will; and they are designed to economise the electric power. The *Volta* will be able to cross the Channel; and, from the silence of her movements, may be used for search or torpedo work.

### A Rug Machine.

A machine for making rugs of yarn, wool, or any kind of cast-off clothing or clippings, has been brought out recently. To make a rug, a foundation is first formed of some striped fabric, on which the material or waste cloth is sewn by the machine, which is of steel, and is capable of working a rug in a few hours.

### Rotary Castors.

A new rotary castor has recently been invented, which can be specially recommended for heavy furniture. It is constructed of brass or iron in all the usual

\* 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.

forms, with vitrified bowls or rollers; and it is made with either a plate for screws, or a socket top, or a centre screw. The novelty consists in the application of four small steel wheels of the "bogie" type, which revolve round the centre pin beneath the socket and immediately above the crown of the horn. The axle-plate, which is of steel, holds the wheels in their places, so that there is no strain on the axle-pins—all the strain coming directly on the top and bottom edges of the wheels. There is a direct and uniform bearing upon the top flat part of the horn of the castor, thus insuring free play to the bowl, resulting in a smooth and steady movement upon the floor.

**Solid Electrolytes.**

In a former note we have described the electric batteries of Mr. Shellford Bidwell, in which sulphide of copper and sulphur form a solid "electrolyte" between metal plates of silver and copper. Professor S. P. Thompson has also observed that a piece of sulphide of copper placed between plates of platinum in circuit with an electric current becomes a kind of small accumulator. That is to say, after the current has passed through it for a time, on stopping the charging current, and connecting the platinum plates through a galvanometer, a current is observed proceeding from the sulphide of copper. The solid sulphide between the platinum plates appears to constitute a "secondary" cell.

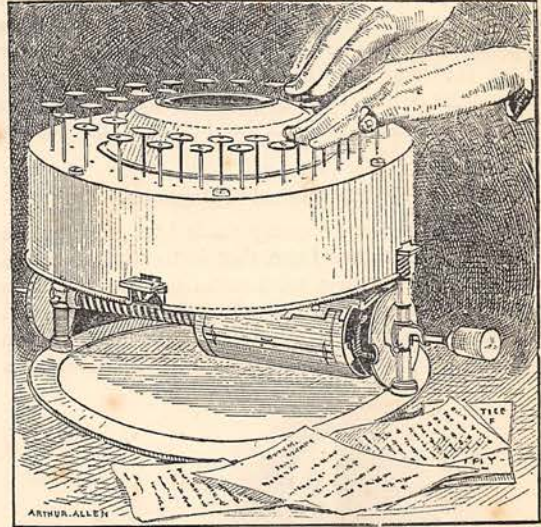
**The Xylophone.**

The Xylophone as a musical instrument was known to the ancients in one form or another; but about 1830 A.D. it was brought into fashion by Gussikow, a Russian musician. Quite recently it has come to the front in France, where it forms a feature in some



orchestras. The form commonly employed is that shown in the accompanying figure. As the name implies, it is "an instrument of wood and straw," and, as now made, the rods of wood of varying length are

strung together by cords, so as to form the triangular figure shown. The frame is laid on bands of straw to bring out the sounds, and render them stronger and purer. The sounds are produced by striking the pieces of wood with a couple of small hammers. All marches and tunes of a quick rhythm can be executed on the instrument.



**A Type Reporter.**

A small and compact type writer has been invented, which it is claimed can be used for reporting lectures as well as for ordinary correspondence. The apparatus is illustrated in the accompanying figure, and weighs only 5 lbs., while it can be easily carried in the hand. The pistons are pressed down by the fingers in printing; and more than one copy can be obtained from the same impression. Moreover, by a peculiarity of construction, the same machine is capable of using different sizes of type. We need not enter into the details of the apparatus, which are purely mechanical; but we may add that the type is inked and strikes the paper itself without any intervening ink-band. The machine is, in fact, a kind of little printing-press. A larger size than that illustrated is produced by the same makers for office use.

**A Revolving Hand-Basin.**

A new washhand-basin has been brought out by a Glasgow inventor, which requires no stop-cocks to be turned on for the admission of hot and cold water, for letting away waste water, or for cleansing the basin. These operations are performed by revolving the basin horizontally.

**An Electrical Clip Light.**

A neat portable electric lamp for surgical examinations has been recently brought out by a well-known firm of electrical manufacturers. It consists of a very small incandescent lamp, silvered on one side to act as a reflector. The lamp is fixed to a double-

hinged clip, by which the light can be brought to bear in any direction upon the object under scrutiny. The apparatus is small enough to be carried in the vest pocket; and the lamp is fed by Leclanché cells, which give a light for about ten minutes or a quarter of an hour at a time. After a rest of an hour, the light can be obtained afresh from the battery. The makers intend to provide a small secondary battery, which can be put in the pocket and used to yield the light. The apparatus can also be used with the microscope, either above the stage for opaque objects, or below it for transparent ones. The light is pure in colour, and the reflector throws a small but bright pencil of rays on the object.

### The Mechanical Telephone.

Experiments were recently made between Ludgate Circus and Chancery Lane, that is to say, the length of Fleet Street, with a mechanical or wire telephone introduced from America. No electricity is used with this apparatus, which is simply a form of the "lovers' telephone," having a taut wire instead of a

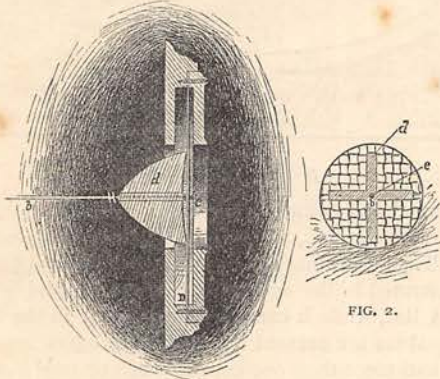


FIG. 1.

string, and a plate or tympanum of plaited willow chips instead of a drumhead of strained skin. The wire runs along the buildings, from which it is supported by brackets and vibration-insulators of india-rubber. At turnings the wire is kept tense so as to transmit the vibrations of the diaphragm set up by the voice. The end of the wire is of course fixed to the centre of the diaphragm, and when the sound sets the latter in vibration, the wire takes these vibrations up and transmits them to a similar diaphragm at the other end which reproduces them as sound. Fig. 2 illustrates the form of diaphragm, D, employed as seen from behind, and Fig. 1 is a section through the instrument. The wire *b*, Fig. 1, is shown in section at *e*, Fig. 2, and *d* is a "sound collector," or cross-cut mass of wood or sonorous body through which the wire passes before it is fixed by a pin, *c*, to the centre of the plaited diaphragm, D. The edges of the sound collector, *d*, just touch the diaphragm and take up its vibrations. The mouthpiece, B, is open both in front and behind. The experiments were said to be satisfactory, and it is hoped that the instrument will be useful in private works and premises. In connection with this subject we may mention that some success-

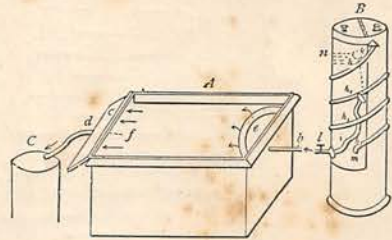
ful experiments were recently made with the telephone between Uxbridge and Liverpool, a distance of 200 miles, over which talking was distinctly heard. The Gower-Bell apparatus of the Post-Office was employed, and the lines had newly been erected. The wires were double, that is to say, there was a going and returning wire, instead of the going wire and "earth" or ground return connection used in ordinary telegraphy. The two wires were also crossed at intervals to defeat the disturbing effects of external induction, that is to say, the induced currents due to telegraph messages traversing other wires near the telephone line. It is customary to cross the wires once in every four spans, that is to say, once for every four posts on the line. The experiments showed that speaking could be carried on over a much greater distance.

### A New Music Folio.

A new music folio, which is suitable for carrying songs or pianoforte music, has recently been patented. Its appearance when closed is very much like that of the ordinary music folio or roll. But when opened it is seen that the strong spring back causes the whole of the folio to lie flat on the stand, and that, as the tapes for securing the various pieces are at one side of the folio, it is possible to use the music without removing it from the case. This, of course, prevents loss and confusion. The spring back gives the folio another advantage, in that it saves the music sheets from being bent or folded down the middle, and thus rendered unsightly when in use.

### Liquefying Oxygen.

M. Cailletet now liquefies oxygen by the cold produced from ethylene boiling in the open air by means of cold air or oxygen blown into it. The degree of cold thus produced is  $123^{\circ}$  below zero Centigrade, and oxygen compressed in a glass tube and exposed to it resolves itself into a colourless liquid.



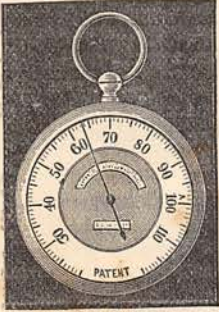
### An Evaporation Meter.

Mr. George Haslam, of Trinity College, Toronto, Canada, has devised the apparatus, illustrated above, for measuring the evaporation from the surface of water. In the figure, A is an evaporating tank; B, a reservoir filled with water up to the point *n*; *h h*, is a graduated glass coil by which water in pouring out through the tap *l* is registered. Pressure on the tap is regulated by a tube and funnel *z*, buoyed up by *k*. The water flows from B to A, through a perforated semi-circular chamber *e*, which makes the fluid spread over the entire

surface of the evaporating tank. Surplus water flows over at *f*, down *c d*, into the reservoir C, which is similar to B, in fittings. Thus the loss from B, less the gain in c, is equal to the evaporation from B. The arrangement is chiefly designed for running water, and removes the necessity of refilling the tank, although good results can be attained by the latter plan also.

#### A Metallic Pocket Thermometer.

A pocket thermometer, of a convenient size and shape, has been brought out by a well-known optician. It is not based on the metallic thermometer of Breguet, in which the unequal expansion by temperature of two dissimilar metals is caused to move a hand upon a dial and indicate the temperature in question. In the new apparatus, which we illustrate herewith, the motion of the hand is obtained from the expansion and contraction of a liquid hermetically sealed in a metallic vacuum.



#### A New Ambulance Stretcher.

A new ambulance stretcher has lately been patented, which is specially adapted for fitting to carts, waggons, pit-cages in mines, &c. The frame-work is constructed entirely of steel, and spiral springs attached to straps, two on either side of the stretcher, support it and prevent all jarring or jolting. A hand-rest is provided, adjustable to various heights, and there is an arrangement by means of which the feet of the occupant may be raised higher than the head. The cover is removable for cleansing purposes, and the occupant lies in contact with canvas only, the steel cross-bars being much below the cover. Though large enough to carry any man, this new stretcher when wrapped up for storage measures only 5 feet 9 inches by 3 inches by 4 inches, and weighs under 30 lbs.

#### Our Ancestors.

A mathematical calculation recently made shows that in taking three generations to a century one has father, mother (2), grandparents (4), and great-grandparents (8), as ancestors—in all 14. Going back two centuries one has in the same way 64 ancestors, supposing that no intermarriage has reduced the number. Following out the calculation, it is found that from the time of the Norman Conquest, eight centuries ago, a person has 16,000,000 ancestors. This figure is so large that, even allowing for intermarriage, it shows the people of a nation are in some degree kin.

#### A Shuttleless Loom.

It is reported that an English inventor has devised a new loom which works without the time-honoured shuttle. At each end of the loom, which is an ordinary

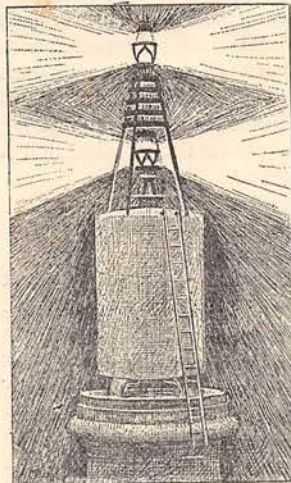
one without the "boxes," a large coil of weft stands on the floor, and this weft is caught by steel fingers which take it across the warp through the sheath as by a shuttle. The weft is cut at the list, and the edge of the fabric is left jagged; but in other respects it resembles ordinary newly-woven cloth. A motion stops the loom when an end breaks, just as an ordinary loom is stopped when the weft breaks. The new loom is said to economise time in changing the shuttle, and the inventor is reported to claim that one operative can tend a number of looms.

#### An Asylum Tell-tale.

This tell-tale is intended to record the fidelity of the night attendant on duty in asylums and other places of watch. It is the design of Dr. J. Millar, Medical Superintendent of the Bethnall House Asylum, and is in use in different English asylums. The apparatus consists of a clock movement, so arranged that the hour axle carries a paper disc instead of the usual hand. It is enclosed loosely in a strong mahogany box, which is kept locked, and fixed at a convenient point on the beat of the attendant. Several of them serve to keep the attendant "on the move." In passing a tell-tale box he inserts a pencil as far as it will go into a hole provided in the lid of the box, and thus makes a mark on the paper disc, which has been already set so as to correspond with the time at which a mark is made. When the clock is wound up in the morning the record is examined. To save changing the paper disc three different-coloured pencils may be used on three successive nights; and the paper may be also shifted so as to record other three nights on a second circle without putting in a fresh disc.

#### A Gas Beacon.

The figure illustrates a new gas beacon light erected



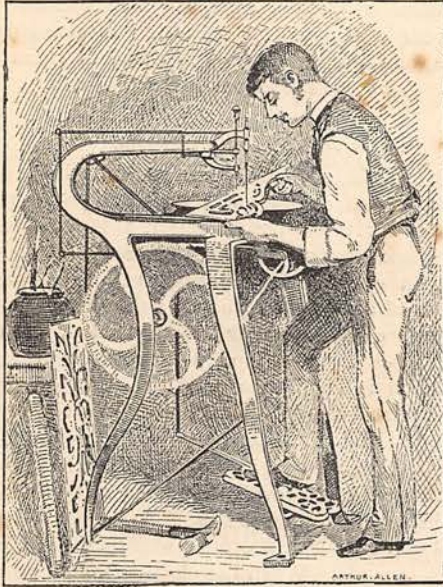
for the Clyde Lighthouse Trust on the Gantochrocks off Dunoon, Firth of Clyde. Steps lead up to the superstructure, which consists of a reservoir or gas-holder containing Pintsch's oil gas under pressure, and two powerful gas lanterns. The lamps show two red lights, and will burn for thirty-five days with one supply of gas. These beacons are very useful, owing to the small amount of attendance

they require, and the bright light which they give.

#### The Great Glacier of Alaska.

The front end of this glacier presents a wall of ice 500 feet thick, and its breadth varies from three to ten

miles, while its length is 150 miles. Almost every quarter of an hour, hundreds of tons of ice break from it and plunge into the sea, raising great waves. The top is broken, and covered with ice-hills and miniature mountain chains. It is stated that the ice advances to the sea at the rate of a quarter of a mile per annum.



The Walking Beam Saw.

Fretwork is now extensively employed; and amateur mechanics and others will be interested in the new walking beam fret-saw which we illustrate. The saw has a vertical action, as shown, and its movement is produced by a lever, like that of a bell-crank, pivoted near the end of the top and bottom arms of the saw-frame. The saw-holder is attached to one arm of each of these levers, the other arms being connected with an oscillating arm at the back of the frame by means of metal rods. By this arrangement the tension of the saw is held to be always the same, and the running free and steady. A nickel-plated tilting table and a blower form part of the tool.

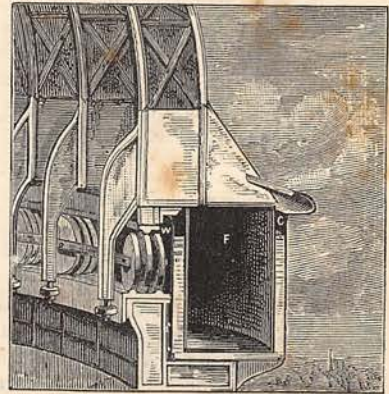
#### The Silex Piano.

It has long been known that certain flint-stones emit a musical note when struck with other flints; and M. Baudre, a French musician, has constructed a piano on this principle. The flints are chosen according to their pitch when struck, and suspended horizontally by their two ends in a row like the keys of a piano. An elegant metal framework supports the stones, and wires are used to suspend them. A sounding-board is placed a fraction of an inch below the row of stones. Tunes are played by means of two smaller flints held in the hands. The stone which emits the greatest tone weighs  $4\frac{1}{2}$  lbs.; that which gives the corresponding half-tone weighs 9 lbs. This large flint is immediately followed by one weighing 1 oz. A 3 oz. stone in the set

gives the same note as another weighing 6,000 grains; so that it is not alone the size of the stones, but other properties which affect the sounds.

#### The Standard Flame.

Hitherto the British unit of light has been the light of a spermaceti candle  $\frac{7}{8}$  inch in diameter, burning 120 grains per hour, or in other words, six candles to the pound. Standard candles are, however, open to serious objections, as the light they give varies 10 or 15 per cent., according to the conditions of the wick and other circumstances. The standard pentane flame of Prof. Vernon Harcourt, F.R.S., has therefore been recommended by a recent committee for use as a standard of light. This flame is produced by burning a mixture of pentane and air (20 volumes of air to 7 of gaseous pentane) in a burner with an opening  $\frac{1}{4}$  inch in diameter. The height of the flame is  $2\frac{1}{2}$  inches.



A Floating Dome.

Domes for covering great telescopes and equatorials require to move round so as to permit the instrument to follow the movements of heavenly bodies. Some of these are floated on water, so as to produce little friction and be easily moved. Such, for example, is the new floating dome for the Nice Observatory, which we partially illustrate. The floating part of the dome, F, swims in a ring or circular caisson containing salt water. The caisson rests on thirty-six strong cast-iron supports rising from a tower of masonry. The revolving motion of the dome is guided by the wheels, w, shown; and it is capable of being moved by the hand.

#### PRIZE COMPETITIONS.

*The Editor hopes to publish the award in the Short Story Competition in an early number of the Magazine.*

*Intending Competitors for the Prize Song Competition, and the Fifty Pound Prize Story Competition, are reminded that the latest dates for these competitions are respectively November 2nd, 1885, and January 1st, 1886.*