

white, and with, as I thought, traces of tears about her eyes, was feverishly talkative and even excited in manner. It was a relief to us all when the meal came to an end, and she and Mr. Talbot departed for the church practice, leaving me and Mr. Danvers *tête-à-tête*.

For once in my life my conversational powers forsook me. I felt convinced that Mr. Danvers was meditating on the same subject as I was, but, like a wise man as he was, he forbore to put his thoughts into words. After exchanging a few commonplaces, we both picked up our newspapers and proceeded to study them. That is to say, I perused mine without taking in a syllable that I was reading, and when I happened to glance at my neighbour, he was holding the *Looker On* in his hand upside-down. It did just as well, I doubt not. The next day, he and May,

after overwhelming us with expressions of gratitude, departed for the cottage, and Mr. Talbot and I were left alone. The same day Mr. Danvers arrived at Cappers, with any amount of luggage, and a new era set in for Monk's Hollow.

With this era, with the departure of the Challoners, the arrival of Mr. Danvers, the emigration of May and her father, I resign my pen once more into May's more competent hands. My task is done. I did but fill up the gap caused by her illness, and whilst the currents of our lives ran side by side. Now, although they are parted but by a few hundred yards, still they flow in separate channels; and it is best that May should resume her pen, and tell the end of her own story.

END OF CHAPTER THE TWENTY-FIRST.

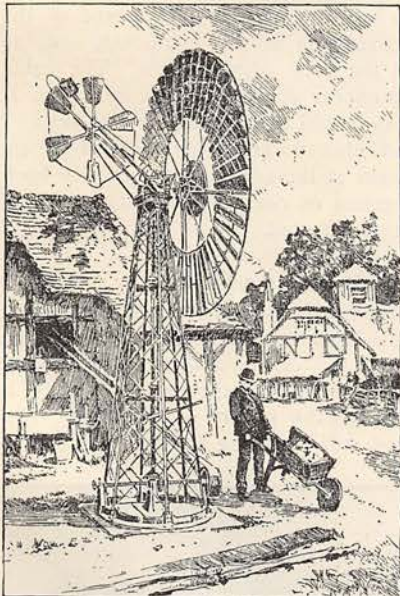
THE GATHERER :

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 Wind-Engine.

Wind-power has gone, to a great extent, out of use since the introduction of steam. Nevertheless, it



tends to come into operation again, if only for driving dynamos or pumping, and country work in general. Its drawbacks are the inconstancy of supply, and the varying force of the wind. The last of these is overcome by a simple regulation of the vanes in the engine, which we illustrate. The vanes are automatically "feathered" according to the wind-pressure, and thus the speed of the wind-wheel is regulated. A circular plate is exposed to the pressure of the wind, and by means of suitable gearing sets the vanes at a more or less acute angle. The speed of the wind-wheel being thus

regulated, the rotation of the vertical shaft within the supporting framework is kept pretty constant, and this in turn communicates its motion to a pulley, from which, by leather belting, the power is led away.

regulated, the rotation of the vertical shaft within the supporting framework is kept pretty constant, and this in turn communicates its motion to a pulley, from which, by leather belting, the power is led away.

Another New Step-Ladder.

There has recently been patented by a Driffield firm a new step-ladder, admirably adapted either for library or domestic use. The steps fold like an ordinary pair, and rigidity is attained in this latest invention by means of a couple of strong spring catches, without the aid of any cord, or further stay. And on the release of these springs the back legs may be turned upwards, when the springs are again brought into action, only on a lower pair of catch-plates, and a safe and handy lean-to ladder is formed. Every reasonable precaution is taken to guard against the possibility of accident, and the result is an admirable combination of the advantages of the ordinary household "step-ladder" and the "long ladder." For the hanging of curtains and pictures this new ladder should be a boon to the householder, especially as it packs away very neatly into a convenient space.

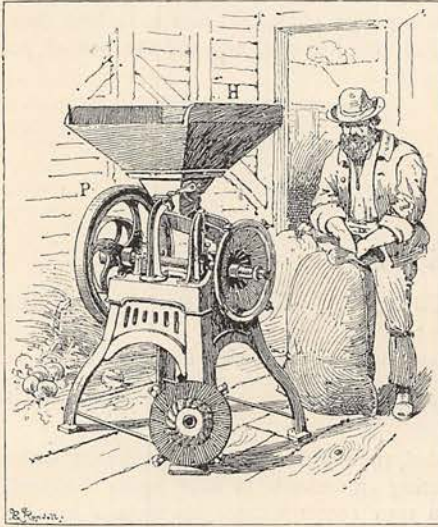
Another Remedy for Hydrophobia.

It is said that in the island of Skye a remedy for hydrophobia has long been known and successfully used. Although we can say nothing on this point, we give the particulars for what they are worth. A handful of leaves of the thorn-apple (*Datura stramonium*) must be boiled in a pint of water, until the bulk is reduced to one-half. The fluid must then be strained

through a fine white cloth, and administered in one dose. If swallowing be difficult, it must be forced down the throat. It is claimed that before long violent paroxysms will ensue, accompanied by copious perspiration; that sleep for eight hours will follow, and that the patient will then be free from rabies.

A New Grinding Mill.

The mill we illustrate is designed for use on farms and estates for grinding fodder, such as grain. The



wheels are of cold blast steel made in the form of conical discs, one of which is shown separate in the figure. They are grooved on both sides, and are thus able to serve, as it were, twice over, by reversing the grinding surfaces. The material to be crushed or "kibbled" is fed into the hopper, H, and the mill driven by the pulley, P. A pair of plain metal rollers, with smooth surfaces for flattening oats or barley, is also supplied with the mill, which is usually driven at a speed of 350 revolutions per minute.

A Manganese Meteorite.

A meteoric stone of special interest has been acquired for the National Museum at Stockholm. It fell in Scania on April 6th, attended by a red flash like lightning and a report like thunder. The weight is 11 kilogrammes, and the hole it made in the ground was 30 centimètres deep, but having recoiled the stone was found on the surface lying near the hole. Its colour is greyish-black, and it appears to consist almost entirely of manganese, which has fused on the outside owing to the friction of the air as the meteorite descended. The red flash "like lightning" and the noise "like thunder" do not, of course, prove that the fall of the stone was actually accompanied by a lightning-flash. The red-hot particles given off may have

seemed to be lightning. But nevertheless the phenomenon helps to account for the many reports about "thunderstones," that is to say, meteorites falling with a flash of lightning, or at least the sound of thunder. Mr. Symons recently questioned the possibility of meteorites being accompanied by lightning, and the matter is still open to investigation.

For Holes in Wood.

Fine sawdust, mixed into a thick paste with glue, will be found an excellent material for filling up nail-holes and broken places in wood.

A New Opiate.

The *Berlinische Klinische* announces the discovery of a new opiate by Professor Kast, of Freiburg. It has been called "Sulfonal," and belongs to the "disulphates" group. The crystals are tasteless, without smell, and readily dissolved. It is stated to have the property of producing sleep in invalids, particularly nervous people, but not in healthy people. Such drugs should, of course, only be used under the authority of a qualified medical adviser. But it is claimed for this that it does not alter the pressure of the blood in any great degree, and it is said to be of a harmless character.

An Ocean Observatory.

The island of Bermuda is a sort of natural observatory for watching gales from the tropics into the North Atlantic, and, as it is about to be connected by submarine cable with Halifax in Nova Scotia, it will be possible for us to get early intelligence of the atmospheric movements in the mid-ocean, and, as it were, to feel the pulse of the storm. The cable is to be laid primarily for imperial reasons, but it cannot fail to be useful in a meteorological respect. We may also add that the entire continent of Africa, with the exception of the north coast, has now been girdled by a system of coast cables. There is no other continent so provided.

An Electric Coal-Digger.

Our figure illustrates a machine for digging under a seam of coal by means of electricity. The machine is run into its place on wheels, and the electric motor is started by an electric current brought to it in wires run along the gallery of the mine. The operator controls the working by the handles, as



shown, and the cutter plies its task on the seam. One of the machines is on view in the Paris Exhibition. By its aid a man and his helper can undercut 110 tons of coal in ten hours, the seam being 6 feet thick. For this the power required at the pit-head is a little over $2\frac{1}{2}$ horse-power.

A Potato-Lifter.

The potato-raiser which we illustrate was recently exhibited at the Royal Agricultural Show, Windsor.



A POTATO-LIFTER.

It consists of a revolving wheel having forked spokes, which upturn the potatoes, and a second wheel with plain spokes which prevent the potatoes from being covered over with earth. An elevated seat is provided for the driver, who, by means of levers, controls the working of the machine.

Dalura Wood Decoration.

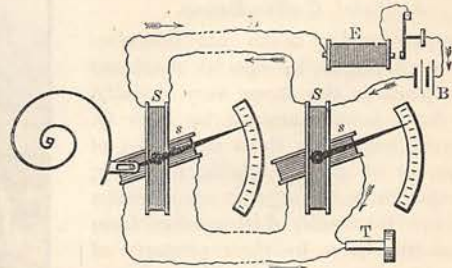
A new method of ornamenting the interior of dwellings has been introduced into London. It is the invention of Mr. Bernard Ludwig, and consists in printing patterns on the wood by means of steel rollers and the application of heat. The figures or pattern thus impressed appear light on a darker ground, and give the effect of carving. This treatment is believed to render the surface of the wood less pervious to damp, and its appearance is highly artistic. Various kinds of timber can be treated in this manner for use in panelling, ceilings, cabinet-work, and so on.

The Tele-inductor.

A means of indicating at a distance the water-level, the temperature, or the height of the barometer, and such-like information, has been devised by M. P. Moennich, of Rostock University. The figure will

explain the principle of the apparatus. There are two "primary" coils of wire, *S, S*, in circuit with the intermittent electric current from an ordinary induction coil, *E*, and a battery, *B*, the wire, *L*, serving to make the connection. The current in traversing these coils induces corresponding currents in the "secondary" coils, *s, s*, which are pivoted inside the primary coils, and fitted with similar pointers which move over corresponding scales. These secondary coils are in circuit with a telephone, *T*, and the currents induced in them,

circulating in the telephone, give out a musical hum so long as the coils are not at precisely the same angles with regard to the primary coils. When they are at the same angle the telephone becomes silent, for the induced currents in *s* and *S* have neutralised each other. It follows that if one coil, *s*, is moved to a certain position on the scale, the other coil, *S*, will have to be moved to the same position on its scale before the telephone, *T*, is silenced. If then we cause the varying water-level, or barometer-level, as



the case may be, to move the coil, *S*, on its pivot, the level can be indicated at a distance, however great, by the person there shifting *his* coil, *S*, until the telephone is mute.

A Parlour Will-o'-the-Wisp.

The natural phenomenon of Jack-a-Lantern or Will-o'-the-Wisp can be produced by very simple means on a small scale. It is, as most people know, the effect



of hydrocarbon gas, generated by decomposing organic matter in a marsh, and in a state of combustion. If we take an open-mouthed glass jar, like that shown in the figure, and put some baking soda in the bottom, then pour dilute sulphuric acid, or muriatic acid, or even strong vinegar, over it, the jar fills with carbonic acid gas. A lighted candle may then be carefully lowered into the gas, as shown, until it goes out, leaving the top of the flame still burning on the surface of the invisible gas. The flame is fed by the gases ascending from the smouldering wick. The effect only lasts a short time, but it can be renewed by raising up the candle till the wick re-lights, then lowering it again as before. The experiment can also be performed with a gas-jet, but in this case the parallel is not so complete, for the candle produces the gas by its decomposition on the spot. It is necessary that the air of the room should be very still for the experiment to be successful.

Artificial Coffee-Beans.

Spurious coffee-beans are manufactured in Cologne by special machines which produce the shape very skilfully. They have been examined by Herr O. Reitmair, who finds them to consist of an extract of coffee, soluble in water, and some insoluble organic constituents. They can be readily distinguished from the natural bean by their property of sinking in water. The genuine coffee-bean floats on water. Moreover, strong oxidising agents do not decolourise the artificial bean so rapidly as they do the natural coffee.

A Sanitary House.

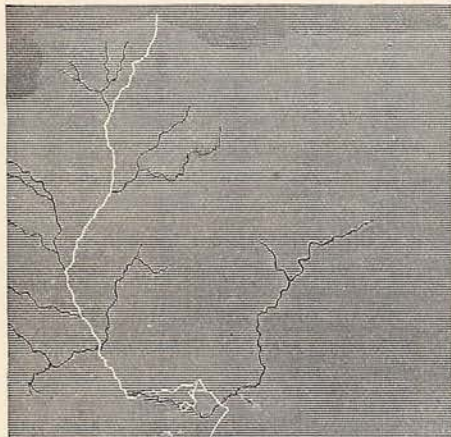
It is interesting to hear of the sanitary arrangements recently carried out for the proprietor of one of the medical journals, in Queen's Gate, Kensington. The house forms one of a terrace, and is so arranged that the drainage can be brought from back to front through the house in a trench lined with concrete and containing a cast-iron pipe 4 inches in diameter, jointed with blue lead. At each end of the pipe there is a manhole and box for inspection formed of glazed porcelain. If the pipe should choke, rods can be passed through it to the main sewer. Both the manholes are closed by two separate doors, having a 12-inch layer of sand between them. The flow from the kitchen sink passes into a siphon flush tank, where it can be retained till sufficient is collected to flush the pipes. The soil pipe runs through the house from bottom to top, and is crowned by an exhaust ventilator. Air is admitted to its base through a pipe in the area fitted with mica flaps. The trap of each water-closet is ventilated into a separate pipe of smaller diameter.

A Farm Railway.

At the recent agricultural show in Windsor Park there was exhibited a light railway for farm purposes, imported from Bohemia. It is the invention of Herr Dolberg, and is much employed in Austria and Germany by the large farmers and landed proprietors. The line is divided into sections, each consisting of two steel rails with rounded tops fitting into the wheels of the bogie trucks, which are grooved to receive them. They are fastened to a wooden or steel sleeper in the manner shown in figure. The line can be laid very simply and expeditiously, as will also be seen, and on almost any kind of farm-land. The upper part of the illustration represents a bogie carrying a supply of sections with their sleepers attached,



and a man laying the line with these in advance of it. For carrying manure into fields, or produce out of them, the line is well adapted, and it may even be useful in large manufactories.



Dark Lightning.

In a recent "Gatherer" we alluded to the "dark" lightning-flash which has been discovered by the aid of photography. We are now able to give an illustration of the phenomenon from a photograph taken by the Rev. A. Rose during one of the summer storms. The dark flashes are seen to be branching from the main bright flash. Mr. A. W. Clayden, who has studied this singular effect, is not a believer in the theory of Professor Stokes, that the darkness is produced by absorbent gases generated by a preceding flash along the same path. Mr. Clayden has made a number of experiments which seem to show that the dark flash is due to the reversal of the photographic image produced by the glare of diffused light on the clouds, and not to a "dark" discharge of electricity. The diffused light appears to undo the photographic effect of the luminous flash in certain cases.

An Elastic Wheel.

An elastic wheel, free from the objections of a rubber tire, which soon wears out, has been introduced by a Leeds firm of engineers. The india-rubber is in this case placed round the nave in the form of a ring, with apertures in it on which the spokes abut. The effect of the ring is that of a cushion or soft buffer, which prevents jarring.

A New Sewing Machine.

A sewing machine of a novel kind has been introduced by a well-known firm. It is called the "vibratory shuttle" or "V.S." machine, and not only works very silently but with the minimum of vibration. The new shuttle is of a cigar shape, and its bobbins are filled automatically. The head of the machine is locked to the table by means of a flat spring, which is released when the works are to be inspected. The new machine is especially adapted for household purposes, and is stated to be inexpensive.

A Manual Corn-Thresher.

A manual thresher for corn, flax, and other seeds, which can be worked by women and lads, without any aid from steam, has recently been introduced. The thresher is of simple construction, and will thresh damp or short grain as well as dry and long. It deals simply with the ears, not injuring the straw, which ties up clean and tight. With such a machine, which is of moderate price, a farmer is independent of steam-threshers, and can thresh when he likes.

Marinated Mackerel.

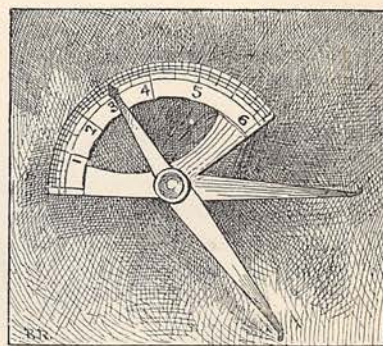
At a recent exhibition of the Cornwall Polytechnic Institution, Mr. Perry, of Penzance, exhibited some marinated pilchards, which were found toothsome after being kept twelve months. The process of marination consists in excluding the air from the fish by a layer of wax paraffin, or ozokerite, which is poured in melted, so as to seal the jar. Honey can also be preserved in this way, and mackerel is now kept by it.

An Automatic Nail-Maker.

An automatic machine for making horse-shoe nails has recently been brought out. Wire is coiled on a reel on the top of the machine, which cuts off, stamps, points and heads the nails without any hand assistance whatever. The receiving box only contains perfect nails, for if there is any hitch in the working the machine stops of itself, and points out by means of an index where the fault occurs. A few moments only are required to remove the offending nail, and the machine starts again.

Indicating Callipers.

The callipers that we here illustrate are designed to indicate on a scale the inside measurement of the thing to which they are applied. One leg of the callipers is prolonged and pointed to form the hand of a graduated scale, which gives the measurement as shown in the woodcut. A modified form of the instrument is also made for telling outside dimensions.



Locomotives as Fire-Engines.

The occurrence of fire in trains has led the directors of the Pennsylvania Railroad Company to modify their locomotives so that they can be employed as fire-engines in case of necessity. A hose is attached to the steam-pump, of sufficient length to convey the water of the cistern to the seat of the fire. This hose

is carried on the tender, and quickly attached to the pump when it is required.

A Live Barometer.

A live barometer has been found very trustworthy in St. Louis (U.S.). It is a small tree-toad, which is exceptionally susceptible to changes of weather. It is enclosed in a glass tube, and provided with a small ladder for it to climb. This ladder it climbs to the very top when the air is moist, and rain is to be expected, but it descends again directly there is a prospect of fine weather.

Ocean Floats.

Floats are to be set adrift by order of Lieutenant Pillsbury, of the U.S. Coast Survey. They will be 8 feet long by $1\frac{1}{2}$ inch square, and made of pine-wood painted white. The staff will be weighted at its lower end by four galvanised iron wings to catch the flow of the currents. A vane at the upper end will serve as an indicator of the float, and masters of vessels are requested to raise the float and make a note of its position, when found, on a form supplied in one of several glass tubes attached to the float. The latter is then cast adrift again, and the form is to be forwarded to Washington.

"Cassell's National Library."

Once more Professor Morley has been enabled to include a copyright work in this series—Professor Francis T. Palgrave's "Visions of England," a collection of lyrics, on the heroes and events of our country's history, that has won the commendation of the most

eminent of historical and literary critics. It is greatly to be desired that the poetry of our history should be more widely known, and we congratulate our readers on the opportunity which is now afforded to all of acquiring this beautiful collection. Recent volumes in this "Library" are Johnson's "Rasselas," and Bacon's immortal "Essays," both of which should, in this handy form, find favour in the eyes of travellers. In poetry, we are glad to see Milton's "Paradise Regained," and Cowper's "Table Talk." Shakespeare's "Henry VI." and Lord Lyttleton's "Dialogues of the Dead" are also now to be found in this series.

Two Books for Ladies.

Some time ago we drew attention, in connection with our "National School of Housewifery," to the new "Book of the Household" which Messrs. Cassell were issuing. The first volume of the work is now complete, and is before us. A more appropriate or more useful present for a tyro in housekeeping it would be difficult to imagine. Every department of household management and furnishing is fully dealt with, and the making and care of clothes for old and young ladies and gentlemen described. In this connection we may mention a little register entitled "Baby's Record," which has just been published by Messrs. Field and Tuer. Blank spaces are left for the particulars of baby's first teeth, first speech, first walk, first illness, and first game—indeed, for baby's first steps in every walk of child-life. It is claimed for the register that its entries would prove very useful to a doctor in dealing with the child's ailments.

BIRDS OF THE MONTHS.

OCTOBER—SWALLOW.

THE sky grows dim, the leaves like lost hopes fall,
And Swallows, joyous comers long ago,
Rise up to take departure—summer friends,
Who leave us lone to meet the coming woe.

