

attaches conventional meanings to words, and sees a joke in departures therefrom, and also in the odd phraseology that at times is thus evolved.

These blunt-mannered Tynesiders have a wonderful local patriotism, which a foremost orator, one of themselves, Mr. Joseph Cowen, has given voice to. A keen observer, who described the Tyne people a few years ago, said that "they lack that fine exterior polish you observe in Liverpool. They are blunt in manners; they rattle their 'r's'; their lower orders converse in an astonishing gibberish which they style 'New-cassel,' and which might have supplied Swift with hints for the language he invents in 'Gulliver;' but they are the warmest-hearted people in the world, hospitable and generous." And these people, with a wondrous faith in their district and themselves, have from the coal below them built up a district, industries, and trades, such as few in the South dream of. Every hour, day and night, for six days a week, a steamer leaves the Tyne with a cargo of 1,250 tons of that coal; and to every land that and other productions of Tyneside are sent. If Carlyle's dictum be true, that "genius is an infinite capacity for work," then the true and stern North is the abode of genius, for the Tyneside folk have that faculty fully developed;

and it is that perseverance in labour which has built up the Tyne and its trade, and moulded the character of its sturdy folk. The casual passenger, flying through the town, express due north, may see something of the special marks of centuries, may notice the old castle, the antique-gabled dwellings, and the red roofs near, as well as the works that continuously give forth volumes of smoke and flame, but he will have little knowledge of Newcastle till he has seen more of its stately streets and halls, something of its many parks and museums, and much of its factories; and though he may know a little of the Tyneside folk from their songs and their stories, from the specimens of the men who in distant parts retain the bluntness, directness, and industry of old, it will not be until he has mixed with them in their family life, seen something of their great meetings, heard some of their orators, and marked a little the manners of the people, alike in Sandgate and in Jesmond, amidst the orators who muster weekly on the Quayside, the merchants who meet on 'Change, and the magnates who represent at Council and Board the people—not until he has had that experience, will he be able fully to appreciate the mingled shades of character that unite in one prevailing tint to make up that of the Tyneside folk.

J. W. S.

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 Gum-Damper.

A gum-damper for closing envelopes, and affixing stamps or labels, is shown in our illustration. The damper has the merit of neatness and simplicity, and is clean in action. It may also be used to wet the tips of



the fingers in counting notes or turning over papers.

Metal-Covered Thread.

Metal-covered wax-thread is now used for sewing leather belts and boot-soles. The thread is covered with brass by means of machines, which lay on the metal as the thread passes through die-holes. After being covered it is roughened externally by small rotating discs having fine teeth. The corrugation thus effected gives the thread a better hold of leather than the smooth metal surface would give. Machines of an ingenious kind have also been devised to sew leather belts, and to affix boot-soles in a few seconds, by means of the covered thread.

The North Sea Canal.

A canal to connect the Baltic with the North Sea is about to be cut by the German Government from Brunsbüttel at the mouth of the river Elbe, *via* Rendsborg and the existing Eider Canal, to the Baltic at Maltenau. Locks will only be used at the ends to avoid the tides, and the trench will be 25 feet deep and 185 feet wide at the water-level. German ironclads will thus be able to pass through it.

A Handy Fire-Escape.

A small fire-escape has recently been brought out, which should be very useful in country houses, and other places exposed to the danger of fire, and where the public appliances for rescue are not close at hand. The apparatus packs away so compactly in the case provided for it, that its continual presence in a room causes no inconvenience. The apparatus should be kept fixed, by means of the two metallic cords shown in Fig. 1, below the bottom

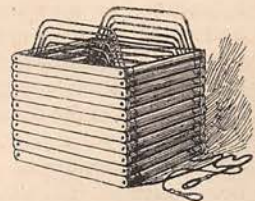


FIG. 1.



FIG. 2.

Lighting Trains in Tunnels.

An interesting application of the electric light to the lighting of trains in tunnels has been made by Mr. Carswell, assistant engineer of the North British Railway Company. Electricity has been employed for some time past to light the goods yard at the Queen Street station of that company in Glasgow, and part of the supply is now used to light trains in the long tunnel outside that station. To this end a conductor is led between the rails, and the electric lamps on the train are connected with it by a moving contact as the train passes along. The electricity of the conductor passes through the lamps, which are of the incandescent order, and lights them. When the train leaves the tunnel the lights are no longer required, and the train breaks contact with the conductor.

A New Copying Apparatus.

A new apparatus for producing a number of copies of a letter, or other document, has recently been patented under the name of "Eclipse." The principle of the apparatus is not unlike that of the old "Graph" machines. The document to be copied is first written in prepared ink, and allowed to dry without blotting. It is then placed face downwards on the gelatine plate of the machine, and allowed to remain there for a few seconds. The surplus writing-ink is next removed from the plate by pressing a clean piece of paper over it, and the negative thus left on the plate is inked by slowly passing a printing-ink roller over it backwards and forwards for some time. The plate being once inked in this way, the actual printing of any number of copies of the document is a very simple matter, requiring only the re-inking of the pad with the roller after each impression. When all the copies have been struck off, it is only necessary to wash the plate with a prepared solution, and after a few minutes it is

sash of the window, and when required for use it is only necessary to lift the ladder and drop it from the open window, as in Fig. 2. The stays shown in our engravings serve to prop the ladder from the outer wall of the building. It may be added that the escape is both fire-proof and rust-proof, and is strong enough to bear several persons at one time.

again ready for use. The great advantage of this apparatus over its "Graph" predecessors is that an unvarying black printer's ink is substituted for the ever-fading aniline inks of the older machines. The new apparatus is admirably adapted for copying music or plans, as well as ordinary manuscript.

Keeping Cellars Cool.

It has been pointed out in a scientific contemporary that the best way to keep cellars cool is to open their windows by night, keeping them closed by day. This allows the cool, fresh air of night to circulate in them. If the air of the cellar be damp, it can be dried by placing a peck of fresh lime in it. This will absorb about three quarts of water, and keep a cellar or milk-room dry, even in warm weather.

A Straw Villa.

At the forthcoming American Exhibition, Earl's Court, London, there is to be exhibited a villa made of straw-timber, that is to say, of straw compressed into an artificial wood. The villa will be two and a half storeys high, of artistic design, and both fire-proof and water-proof. Every part of it—walls, foundations, floors, roofing, chimneys—is to be made from straw.

Leather Door-Mats.

Door-mats are now made from scrap leather, which is formed into links, threaded on metal rods or wires. The appearance of the mat is pleasing, and the materials are made up in scalloped or other patterns. It is flexible, and is said to afford a safe footing, while being at the same time durable.

Tar as Fuel.

In order to burn coal-tar efficiently as a fuel it is turned into spray, and then mixed with atmospheric air. The figures illustrate a new machine for this

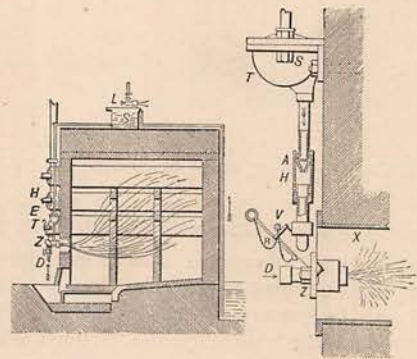


FIG. 1.

FIG. 2.

purpose, which has only recently been devised. The tar is raised to the reservoir S, by means of a pump, and it is kept liquid by the heated state of the reservoir. From a pipe E, the tar passes into a cap T

(Figs. 1 and 2), which contains a strainer for keeping back impurities. The tar then flows through the pipe A H (Fig. 2), and enters a vaporiser Z, which is also traversed by a jet of steam which enters by the pipe D, as shown by the arrow, Fig. 2. The spray of mingled steam, tar, and air then burns with fierce heat and flame in the furnace chamber as shown.

A New Gem.

A new precious stone, named "Hiddenite" after the discoverer, Mr. Earl Hidden, has been found in Alexandra county, in the Southern States of America. It is in the form of slender crystals of emerald colour, but differing from the emerald in other respects. True emeralds, topazes, aquamarines, and other stones are also found in the same vein.

A Fire-Extinguishing Compound.

Mr. E. Martin, of Munich, has composed a compound which extinguishes fire, and has been successfully used for this purpose in Switzerland and Austria. The German Admiralty have also recommended it for their naval yards. The compound is a mixture chiefly of common salt, alum, soluble glass, and tungstate of soda. It can be obtained either in a solid or liquid form, and is thrown on the fire either by pumps or pails.

A Hinged Lamp-Post.

A hinged lamp-post has lately been devised. It has the advantage that no ladder is required to enable it to be cleaned and repaired; and it can also be lighted by bending it over: the lamp-lighter carrying a key for the purpose.

A Self-Acting Water-Sprinkler.

Automatic fire-extinctors for mills and warehouses are coming into use, and one of these, the "Vulcan," is illustrated in action in our engraving. In its ordinary form this apparatus consists of a brass body fixed on the water-pipe of the room in which it is placed. The body has a tube projecting downwards at right angles, as shown, and communicating with the water-pipe. Over the orifice of this tube is fixed a cap, by means of sensitive solder, which melts at a comparatively low temperature such as would be produced by an outbreak of fire near the place. The melting of the solder releases the cap and frees the water, which is projected by pressure into the neighbouring space, after the manner shown in the figure. Several varieties of the "sprinkler" are made for different situations. The "Vulcan" opens at a temperature of 273° and 258° Fahrenheit.

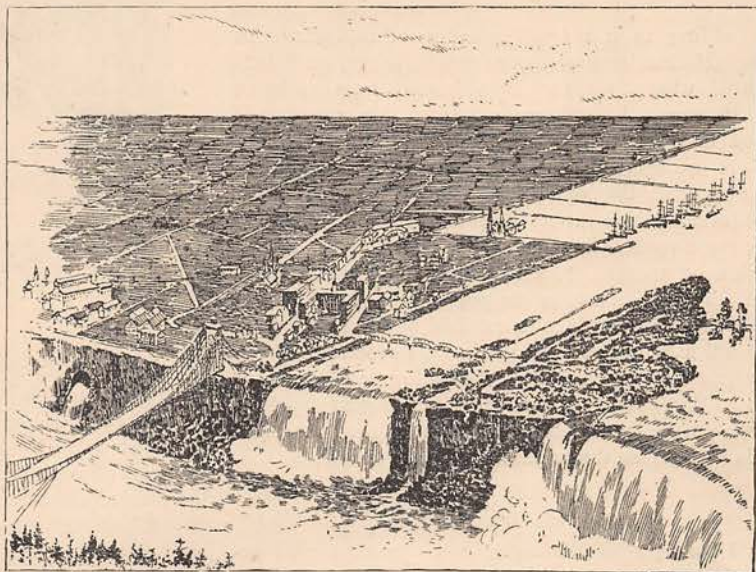
There are other "sprinklers" of this order, notably the "Grinnell," which opens at 289° F., and the "Simplex," which opens at 360° F. In general a



sensitive sprinkler—that is to say, one opening at a comparatively low temperature—would seem to be preferable, since it does not allow the fire to gather strength before it operates.

Utilising Niagara.

A practical scheme for utilising a portion of the water-power of the Niagara River at the Falls has received the sanction of the New York State Legislature: a fact which argues for the practicability of the scheme, and its harmlessness from the scenic point of view, since the same Legislature set apart the



UTILISING NIAGARA.

immediate neighbourhood of the Falls as a preserve or pleasure. The illustration will serve to explain the scheme, which consists in running a tunnel, or conduit, 30 feet in diameter, from the river-level at the base of the American Falls to a point a mile or two above the Falls, where it will reach to within 100 feet of the surface. The intervening depth between this point and the level of the river will give the necessary "head" of water to drive a number of mills or dynamos, which can distribute power to a distance or make use of it on the spot. The point in question will be about a quarter of a mile from the river-bank, and lateral canals to the river will here be made, the tunnel serving as the outlet for the water after its power has been utilised by turbines or water-wheels. A million horse-power is expected to be provided by the scheme, and a manufacturing town with docks and railways is planned in connection with it.

A Gelatine Hygrometer.

An apparatus for registering the degree of humidity of the atmosphere has been devised by M. Nodon, a French meteorologist. Gelatine has the property of absorbing a quantity of water proportional to the hygrometric state of the atmosphere, and of increasing in weight and bulk proportionately to that state. Gelatine, therefore, has been chosen by M. Nodon for the basis of his apparatus. It can be rendered durable

by adding to it a small quantity of salicylic acid. The gelatine is spread over strong paper, or Bristol board, whose interior is protected from moisture by bitumen. Spirals are cut from this paper, and used in the apparatus which is shown in the figure. There are four gelatine spirals *s s*, each having an end secured, the other free and acting on pulleys *R R*, over which a thread passes. The pulleys are in the same vertical line, and the thread carries a sliding stylus, or marker, *P*, which runs in parallel guides *G G*. The stylus marks its position on the travelling band of paper *B*, which is unrolled by clockwork from the roll *R'*. The twist of the spirals produced by the dampness of the air works the pulleys, and raises or lowers the sliding stylus on the paper, thereby marking a line on the latter, which is shown in the figure, and tells at a glance the humidity of the atmosphere.

Lithanode Accumulators.

"Lithanode" is the name given to a material designed for use as the negative plate, or "element," in

voltaic cells, accumulators, and electrotyping baths. It is a dense coherent form of peroxide of lead, capable of being made into plates of any required size. According to the inventor, it is manufactured by mixing oxide of lead with a solution of ammoniac sulphate, which is decomposed by part of the oxide, while plumbic sulphate is formed. The resulting coherent mass is then treated by the electric current, and converted into "lithanode," or peroxide of lead, in the dense condition required. Such a material, the inventor claims, allows of a reduction in the weight of accumulators. One of the large electric light and power companies has taken up a variety of lithanode, and is constructing accumulators having plates of spongy lead and peroxide of lead in the lithanode form. The cells at present made contain thirteen plates, and measure 11 inches long by 6 inches wide and 7 inches deep. The weight of a cell is 20 lbs., and its storage power is 115 "ampere-hours," that is to say, it stores electricity sufficient to give a current of 115 amperes for an hour, or one ampere for 115 hours. It is stated to give 5 ampere-hours per pound weight. The plates are fixed in frames of celluloid. The accumulator is being tried at the Post Office for electric lighting uses.

A New Tent.

Captain Newburgh-Stewart, R.N., has devised a "balloon expansion" tent, so called from its shape, which is illustrated in the figures. Instead of being conical, the tent bulges out, as shown in Fig. 1, where the dotted lines show the conical outline. The bulging is produced by depressing the apex of the tent-frame by hanging a weight to it, such as a sandbag or piece of baggage. No other fastening is required



for the tent in fine weather, but in rough weather the bag is replaced by ropes going to a ground-fastening in the centre of the tent, and by four holdfasts fixed into the earth by iron pins. The frame of the tent consists of eight ribs of American elm simply resting on the ground; the door-flap rolls up like a window-blind, and the tent, as a whole, besides being light, is said to require little trouble. The inventor states that it can be erected in two minutes. The beehive form

of the tent also allows of freer movement amongst the persons inside than the conical or wigwam tent.

Crocodile-Skin Binding.

It has been found that crocodile-skin, when properly treated, forms a most durable and effective binding, and rivals the finest morocco in appearance. The skin is now, therefore, extensively used; but there is nothing new in this, since hundreds and hundreds of years ago many of the Egyptians, who did not share in the general reverence for this denizen of the Nile, were accustomed to utilise crocodile-skin for covering their rolls of papyrus.

Manganese-Steel Wire.

Professor W. F. Barrett, of Dublin, has been investigating the properties of some wire manufactured from steel containing 12 to 14 per cent. of manganese. This wire has the peculiar property of softening when suddenly cooled, and hardening when cooled slowly. Its electrical resistance is very high, being nearly four times that of German silver, and about eight times that of ordinary iron. Hence Professor Barrett recommends it for electric-lighting resistance coils. Manganese steel has very feeble magnetic properties, and therefore Professor Barrett thinks it would be serviceable for building the hulls of ships, since it would not affect the compass like other steel. In fact there are many uses for it. Its tenacity is great, and amounts to 110 tons per square inch of sectional area in the case of hard wire, and 48 tons in the case of soft wire. Moreover, though it has enormous tenacity, it "gives" more than steel under a sudden stress, recovering itself, of course, if the limit of elasticity is not surpassed. Its freedom from magnetism may render it specially useful in these times.

An Easily-Opening Tin Can.

The woodcut illustrates a new tin can which is easily opened and easily soldered. The end of the can, as will be seen from the figure, has a turned-up edge, which is inserted into the body of the can until the rim of the end is flush with the rim of the body. The can is then soldered by dipping the end into a bath of molten solder. In the groove of the rim a fine wire is laid and covered by



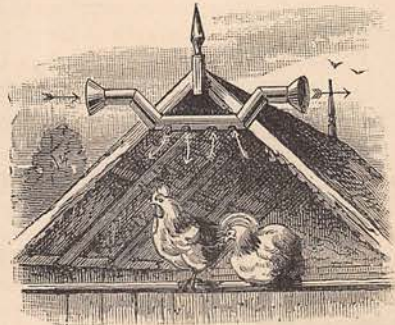
the solder, except that one end is left clear and made into a loop. On inserting a pencil, key, or such-like article into this loop, the wire is pulled out, cutting through the solder and freeing the cover, as shown in the figure.

Blades from Horse-shoes.

A Chinaman is stated to have discovered that cast-off horse-shoes make good cutlers' steel. The wrought iron of the shoes having been constantly hammered acquires the hardness of steel. It is also supposed that the animal heat of the hoof has something to do with it. The metal is said to be good for the manufacture of knives and sword-blades.

A Glacier Cavern.

Professor Forel, of Morges, in the canton of Vaud, Switzerland, has discovered a great gallery or cavern, running into the base of the Arolla glacier, at Eringhertal (Valais). It has been explored to a depth of over 250 yards, and is found to divide into galleries, which were not visited throughout. The height varies from 6 to 10 feet, and the width at some parts is over 75 feet.



A Portable Ventilator.

Captain H. D. Terry, Chief Constable of Northumberland, has devised a portable ventilator, which can be applied to wood, iron, or other buildings, and is particularly useful in poultry-houses. The ventilator is illustrated in the figure, and consists of a bell-mouthed tube, bent in the manner shown, and perforated with air-holes at its middle part. The tube is fixed across the ridge of the roof within the building, and the air circulates in the manner shown by the arrows. The tube is stopped at the middle in order to force the fresh air to enter the house, and the outer ends are movable and can be turned to face the prevailing wind. The ventilator is made in three sizes, of zinc or other metal.

Duplicating MS. by Photography.

A publishing house of New York is preparing a dictionary, and, as loss of the manuscript would be a heavy blow to them, the "copy," or MS., has been duplicated by means of photography. The photographic duplicates are reduced in size, each page being 2 inches by $1\frac{3}{4}$ inches. A number of pages are thus photographed on a single negative, and the cost of duplication reduced. The negatives are stored in safe places. Should it ever become necessary to use them through loss of the original MS., they can be enlarged to any convenient size. We understand that other American publishers of magazines employ this method of preserving copies of MS. kept for publication.

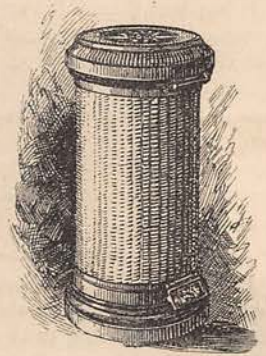
Deep-Sea Photography.

Experiments have recently been made in France with the electric incandescent light and the camera in photographing under water. It is proposed to photograph sunken ships, works, and so on by this means; and it is expected that the apparatus will be useful to divers. We may mention that M. Marey has succeeded in taking instantaneous photographs in the $\frac{1}{2000}$ of a second, and he hopes to reduce this period by exposure still further.

A New System of Gas Cooking.

A well-known London gas engineer has turned his attention to cooking by gas, and recently exhibited a "Parisian roaster" in which the meat is roasted in an enamelled chamber having a glass door by which its condition can be seen. No gas-mixed air can come into contact with the meat. There is a governor for the gas, so as to keep the temperature constant. The inventor says it will cook a 12 lb. joint of meat in two hours at a cost of 1½d., and with a loss of only from 8 to 12 per cent., whereas by ordinary methods of cooking the loss he estimates to be double this

amount. The cooking is done by the radiant heat of luminous flames from steatite burners; all direct contact between the flames and the pots or pans used in cooking is avoided. Various stoves, heaters, and ovens have been devised on this same principle. The figure illustrates a "mail-clad" stove, which consists of an armour of spiral wire rods applied to the well-known "Nautilus" cylindrical stove. This increases the radiating metal surface five times, according to our authority, and at the same time allows pure warm air to circulate from the wire coils into the room. The mail is also stated to render the stove safer against fire due to ignition of light articles coming into contact with it. It is intended to warm large rooms, churches, stores, and so on.



LETTER COMPETITION.



A PRIZE of Two Guineas is offered for the best Letter to be written in accordance with the following circumstances:—Alpha and Beta are two girl friends who have recently had a serious difference on these grounds—Beta believes she has good reason to suspect that her lover has been estranged from her by the artifices of Alpha; while, on the other hand, Alpha is entirely innocent of any such disloyal designs, and deeply feels the accusing attitude of her friend. The actual plotter is Alpha's mother; and the mother of Beta, seeing how the matter really stands, determines to bring about, if possible, a reconciliation between the two girls, without wounding the feelings of Alpha as regards her own mother. Competitors are to imagine themselves in the place of Beta's mother, and to write to Alpha such a letter as would be calculated to bring about the desired reconciliation.

The Letter must be legibly written on foolscap-sized paper, and is not to exceed 600 words in length. All MSS., duly authenticated in accordance with Rule 3, must be sent so as to reach the Editor not later than May 2nd, 1887.

The following are the conditions under which this Prize is offered:—

1. Every Reader of the Magazine is eligible to compete for this Prize.
2. The Editor cannot undertake to answer inquiries having reference to the treatment in detail of the subject of the Competition. *The description given is sufficient for the purposes of the Competition, and the rest is left to the judgment and discretion of the competitors.*
3. Each MS. must have inscribed on it, or otherwise securely attached to it, the name

and postal address of the author, together with a declaration that the work is *original and entirely the sender's own*, to be signed by the author and countersigned by some other trustworthy person, *i.e.*, a magistrate, minister of religion, or householder, with the postal address in both cases.

4. The copyright of the Prize work will become the property of the Proprietors of this Magazine.
5. Should the two best works in the Competition prove of equal merit, the Prize may be divided at the discretion of the Editor. The Prize may be withheld in the event of no composition being thought worthy of that distinction.
6. The Editor will not be responsible for loss or miscarriage of any work, and all letters or packets must be *prepaid*.
7. *The Editor cannot undertake to return unsuccessful MSS.*—copies should therefore be retained by the senders.
8. Every MS. must be sent *before* the date named above as the latest day, addressed—The Editor of CASSELL'S MAGAZINE, La Belle Sauvage, London, E.C., and must have the words "Letter Competition" in the top left-hand corner of the envelope or wrapper.