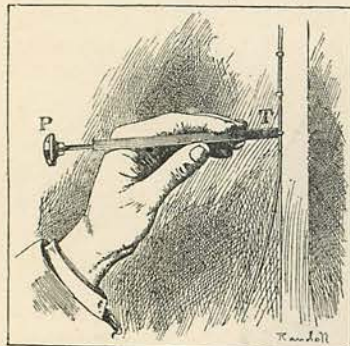


THE GATHERER:

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 Handy Staple-Driver.



A useful staple for running bell and other wires is shown in our engraving. It consists of a rectangular tube, T, of a size adapted to the staples, and in which is a plunger, P, with a stroke of about half an inch. The

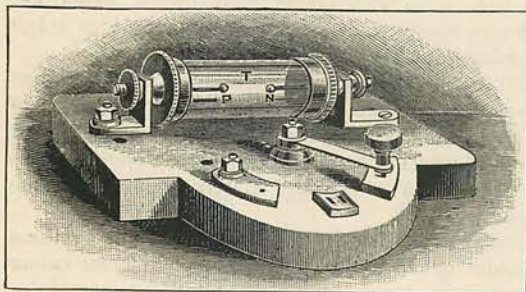
staple is put in the end of the tube, and the points placed over the wire. A blow on the plunger fixes the staple. The tube is then removed, and the staple driven home with a hammer in the ordinary way.

A New Weigher.

Señor Joce Solar, of Barcelona, has brought out a balance which weighs either large or small articles. This is accomplished by having one scale pan very large, the other small, and balancing on the steelyard principle. The balance also checks the price by means of a third pan which moves along the steelyard arm, which is graduated in money values. The rate per kilogramme being known, the money pan is moved to that position on the arm and money put in it until it balances the weight of the article. The amount of money put in is the price of the article.

An Electric Fault Detector.

The little apparatus shown in the engraving is intended for use in households which are provided with the electric light. It consists of a glass tube, T, containing a liquid into which two metal poles, P, N, project from the ends of the tube. One of these poles is connected to "earth," and the other is touched by the positive or negative wire of the electric installation.



If there is a fault on one or other of these wires the liquid in the tube becomes coloured at one of the poles in the tube. The device is simple and requires no electrical knowledge on the part of the user.

The Wyandot Cave.

The newspapers have informed us that another Mammoth cave like that of Kentucky has been discovered in Josephine county, Oregon, containing many beautiful galleries adorned with translucent stalactites and milk-white columns of alabaster, and diversified with ponds, streams, and falls of clear water, one of which is 30 feet high. It was explored for several miles and traces of bears were found inside. We shall probably hear more about it by and by, and in the meantime we may draw attention to the brave feat of three boys who, in company with Mr. Frank Rothrock, recently explored a third Mammoth cave in Indiana, namely, that known as the Wyandot Cave. They took with them a stock of candles and after hours of trying and perilous risks of life and limb, during which they advanced for miles into parts of the cave never before visited, they lost their way just as their stock of candles began to fail. Descending into a kind of pit as a last resource—a pit from which they would not have had any strength left to climb out—they luckily came upon a ladder they had left behind them, and recovered their way out.

A Picture Telegraph.

The "Electro-artograph," as it is called, is an attempt to transmit photographs by electricity, or in other words, to engrave by telegraph. It is the invention of Mr. Amstutz of Cleveland, Ohio, and is to a certain extent successful, as the figures will show. The process consists in photographing the picture on a "stripping film" of gelatine and bichromate of potassium. Such a photograph washed with lukewarm water to remove the portions not hardened by the action of the light, gives a picture in relief, which is more or less high according to the tones of the original. The next step is to vary the strength of current in the telegraph wire according to the variations of light and shade in the picture, that is to say, according to the heights and depths of the etched film. This is



FIG. 1.

done by an arrangement similar to the stylus which moves over the indentations on the wax surface of the phonograph. The point of the style passes over every part of the film and trips up and down according to



FIG. 2.

the degree of relief. By a multiplying lever its movements up and down are caused to depress a series of light keys which send electric currents into the line. If the relief is very low only one key is depressed, and more keys are closed in proportion to the depth of the relief. The current is thus varied in strength according to the degree of relief on the film. At the receiving end the current passes through an electro-magnet, which bears with more or less force on a travelling graver according to the strength of the current, and the design is cut in a surface of wax from which an electrotype can be obtained for printing purposes. Fig. 1 represents a portrait on the film, which was sent over a line twenty

miles long, the reproduction being shown on the same scale in Fig. 2. The inventor hopes to improve his method and to render it a useful adjunct to modern journalism. The time occupied in sending an illustration the width of a newspaper column need not, it is stated, be more than ten minutes, and it is claimed that impressions can be made from the wax by papier maché, so that the engraving can be directly stereotyped in the ordinary way.

The Decay of Saffron Cultivation.

About three hundred years ago there was cultivated in this country, especially about Saffron Walden in Essex, a plant of considerable interest—namely, the Saffron Crocus (*Crocus sativus*). It has long since ceased to be known as a crop plant with us, though it is



said its growth still lingered in some parts of England down to 1829. At the present day it is grown chiefly in France, Spain, and Italy, and also to a small extent in Persia, North India, and China. Its culture in the East goes back to remote antiquity. In Spain it did not

spread till the tenth century and reached France and England about the fourteenth. Saffron formerly had a reputation as a stimulant and antispasmodic and was likewise, and is still occasionally, given to children to develop eruption in suspected measles. Its chief use at the present time is as a colouring and flavouring agent and as a condiment, which uses still linger on the Continent, and, to a less extent, in Cornwall. Genuine saffron consists of the stigmas picked out from each separate flower, and as it takes 7,000 to 8,000 flowers to yield three and a half ounces of marketable saffron it is an expensive article, and very liable to adulteration, the florets of Safflower (*Carthamus tinctorius*) being mostly used. In Spain the owners have announced their intention at the end of the present season to dig up the bulbs and seek a more remunerative culture.

A Fire Tell-tale.

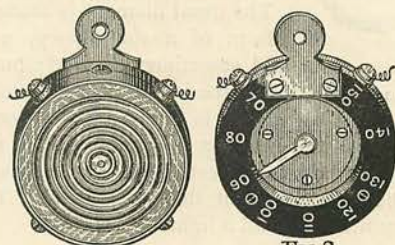


FIG. 1.

FIG. 2.



FIG. 3.

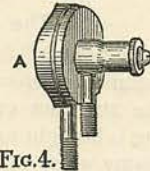


FIG. 4.

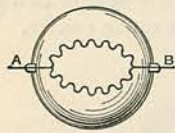
The device which we illustrate, back and front, in Figs. 1 and 2, is intended to give warning of an excessive rise of temperature on the outbreak of a fire by the ringing of an electric bell. The heat causes a corrugated diaphragm to close the circuit of the battery and ring the bell, and the apparatus can be set by means of the pointer (Fig. 2) to indicate at any given temperature. Figs. 3 and 4 are two forms of regulator for gas, fires, and urns, by which the heat is kept within bounds. Inside the chamber, A, A, there is a series of sensitive diaphragms which expand and contract with changes of temperature, and open or close the passage for the gas, thus controlling the supply according to the temperature required. While upon this subject we may draw attention to a new fire extinguisher which has been introduced by some Canadian inventors. The mixture of water and carbonic dioxide it contains is under the very high pressure of 1,000 lbs. to the square inch, and, on escaping from the cylinder containing it, is frozen by the cold due to its sudden expansion. The chilling effect of the cold is thus added to the choking effect of the gas.

Eucalyptus and Sick-rooms.

The custom of placing green boughs of the eucalyptus or blue gum tree in sick rooms is extending

in Australia. It is stated that the volatile perfume has a favourable effect on consumptive patients, and is also able to promote sleep. Dr. Curgeven expresses his opinion that if placed under the sick bed in cases of scarlet fever, the boughs will disinfect it and every article in the room. While on the subject, we may mention that a German investigator has recently examined the dust of railway carriages in which consumptives are taken to a hospital near Berlin, and found it to contain the bacilli of that disease. It would be well if such carriages were thoroughly disinfected after use.

The Corona Electric Lamp.



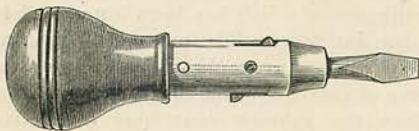
A new form of filament for electric incandescent lamps has been introduced by Mr. Bailey, and can now be obtained from lamp makers. The usual filament is made in the form of a single loop, which is sometimes plain and sometimes twisted; but in the "corona" lamp, the shape is that of a wavy circlet or diadem, and the circle is supported horizontally in the middle of the bulb by two electrodes, A, B. This form gives a beautiful sheet of light in the heart of the bulb, and if one half of the circle breaks, the other half continues to yield a light.

The Ghost Train.

The new "ghost" train running between New York and Boston every afternoon, except Sunday, is attracting some attention even in America, where railway travelling is brought to a fine art. The carriages are of a creamy white outside, with decorations in gold; all the cars, which are of the Pullman order, have paper wheels, and are brightly illuminated with gas jets after dark. The gas is carried in cylinders under each car. The cars are heated with Baker's heaters. Each train consists of a combination car, with luggage van and smoking-room. The latter is carpeted, furnished with willow chairs, and upholstered like an hotel room. The drawing-room cars have revolving and reclining chairs, and many other conveniences. There is no distinction of class, the humblest traveller being free to enjoy all the comforts of the train.

A Ratchet Screw-driver.

The screw-driver which is shown in the figure, has been brought out by an American firm, and is con-

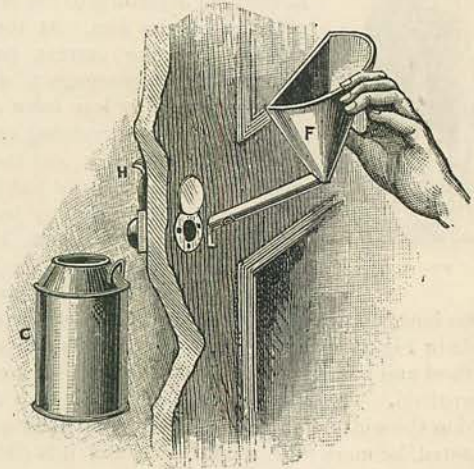


structed on the ratchet principle, so as to allow the hand to keep its hold of the handle. The motion takes place between the handle and a spindle controlled by a movable ratchet. A simple movement of the projecting panel up or down enables the driver to be used for a right or left hand screw.

Utilising Refuse.

A method of utilising the contents of the dust-cart is now in operation at Chelsea. The cart is tipped into a machine, and the contents undergo a sorting and sifting action, the paper, straw, rags, tin, etc., being separated, and the offensive material ground up with the cinders and deodorised. The ashes find a sale among brick-makers, and by mixing them with pitch they can be pressed into briquettes for fuel. The paper is reduced to pulp, and the straw is employed in making straw boards.

A Milk-Receiver.



The practice of leaving milk at house-doors in cans or pithers is attended with inconvenience, if not risk, and hence the new plan of delivery which we illustrate. The milk is simply poured through a hole made in the door. A hook, H, is fitted to the inside of the door and arranged to open the hole when the can, C, is hung upon it. The milkman displaces the lid, L, and puts his funnel, F, through the orifice, as shown in the second figure. When the can is removed from the hook, the hole is automatically closed again.

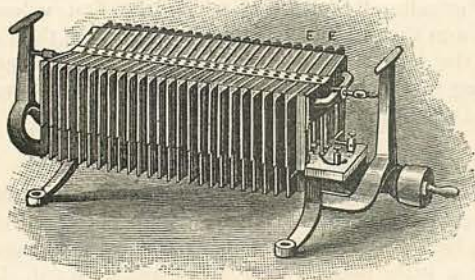
A Steel Chimney.

A chimney of steel, 250 feet high and 9 feet 5 inches in outer diameter, will be one of the features of the Chicago Exhibition. The steel will be $\frac{3}{8}$ inch thick at the bottom and $\frac{5}{32}$ inch thick at the top; and it will

be lined with brick below and tiles above, the lining being supported every 25 feet by angle irons rivetted to the steel shell. Had the stack been entirely constructed of brick it would have been 16 feet 6 inches in outer diameter.

The Gulcher Thermo-pile.

One of the most interesting exhibits at a recent electrical exhibition was the Gulcher pile for deriving electricity from heat. The apparatus is illustrated in the figure. It contains 50 elements placed in parallel rows on a bed of slate. Each element, E E, consists of a nickel tube joined to a prism of an alloy



—antimony with another metal. The elements are insulated with asbestos, and heated with gas jets, one flame to each element. As soon as the gas is lighted the current flows, and attains its maximum strength of 5 ampères, with an electro-motive force of 4 volts. A smaller pile of 25 elements yields the same number of ampères at 2 volts. The gas consumed in these piles is 200 and 100 litres an hour respectively.

Oyster Cages.

A French oyster grower has introduced a novel device for promoting the culture of oysters. It consists of a tray about two feet square and four inches deep, made of wire network, and supported by an iron frame. The oysters are laid in the trays, and these cages are ranged on the frames in tiers, one above another. If the depth permits of it, the frames may rest on the bottom, otherwise they are suspended from rafts or floats. The oysters are thus kept in a circulation of favourable water, and out of the reach of unsuitable bottoms, or hereditary enemies, such as "five-fingers" and other animals.

Home Novelties.

To many of our readers the most interesting class of inventions is that which includes the little improvements and modifications in household utensils. The great discoveries of science may ultimately revolutionise our domestic economy, but their immediate effect on the home is not large. It is different with a novelty for the kitchen, the table, or the sick-room, the advantage of which can be procured at small cost, and at once. We have before us, for instance, a new pie-dish, with an overhanging rim, thanks to which the cook is enabled to handle or turn a pie in the oven without fear of spoiling the pastry or crust, and without stooping, on her part, so close to

the oven, as is necessary with the old form. Probably this little improvement will save many a burnt knuckle and scorched face. Then, for the table, there has just been brought out a new carving-dish for poultry, in which the novel feature is an upright metal spike fixed in the centre of the dish, that secures the bird firmly under the carver's hand, and enables him to get gravy from the dish without fear of the bird slipping on to the table-cloth. As the spike can be removed when the dish requires washing, there is no danger of its doing damage when it is not in use. And, lastly, for the sick-room, we have before us a bronchitis tube, which can readily be attached to any ordinary kettle and so make a "bronchitis kettle" of it. The method of attachment is very simple. A couple of discs, of different sizes, are supplied with the tube, and the one which more nearly corresponds with the aperture of the kettle-lid is used to close over that opening, and is held by a sliding loop of wire to the socket on which is fitted the long tube.

An Electric Parcel Exchange.

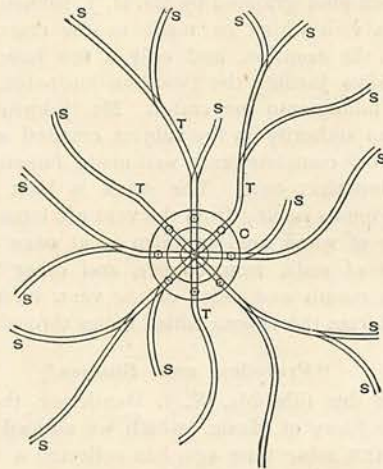


FIG. 1.

Mr. A. R. Bennett, M.I.E.E., has developed a system of carrying parcels by electricity, which contains some novel features. Fig. 1 represents a general plan of his lines, which would be small electric railways laid in tubes, preferably underground. The central exchange is shown at C, to and from which the parcels would circulate by the branch lines, T, T, to the subscribers' sidings, S, S. Fig. 2 shows a section of the tubes in which T, T' are the parcel trains, running on rails, R, R, by means of electricity conveyed along parallel conductors, P C, and collected from these by brushes, C, C', to feed the electric motors driving the trains. Mr. Bennett thinks that if such a

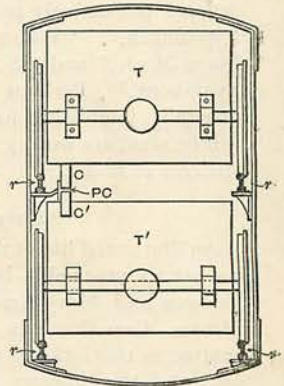


FIG. 2.

system were introduced into large cities, such as London, the vehicular traffic of the streets would be greatly diminished.

An Aluminium Steamboat.

One of the most recent novelties is a small steamboat entirely built of aluminium, which some regard as the "metal of the future." It is twenty feet long by five feet wide, and the screw, as well as the engines and hull, are of aluminium. The motor is worked by naphtha, and develops two horse-power. One of the advantages of this metal for ships is its lightness, and, of course, its white colour and durability are also in its favour, especially for pleasure craft. We may add here that aluminium is found to render steel castings wonderfully sound and tough when added to the ingots.

Volcanic Chimneys of Vesuvius.

Several of the curious fumeroles or lava chimney stacks formed during the recent eruption of Vesuvius have been photographed by Mr. H. J. Johnston-Lavis, during a visit which he made to the crater at the time of the eruption, and only a few hours before Señor Silva Jardim, the Brazilian journalist, lost his life by falling into the crater. Mr. Johnston-Lavis, who is an authority on the subject, counted seven examples of complete and well-made fumeroles and many imperfect ones. The stack is built of lava, and the fumes issuing from the vent are intensely hot. A piece of wood held in them is at once charred. Crystals of soda, iron, copper, and other minerals line the mouth and sides of the vent, having been secreted from the vapour which issues through it.

"Preludes and Studies."

Under this title, Mr. W. J. Henderson, the author of "The Story of Music," which we noticed in THE GATHERER some time ago, has collected a series of critical papers on "Musical Themes of the Day," published by Messrs. Longman in a very handy volume. We cannot give a better idea of the work than by enumerating its four divisions, which are devoted respectively to "A Study of 'Der Ring des Nibelungen,'" "Wagneriana," "The Evolution of Piano Music," and "Schumann and the Programme-Symphony." Perhaps the third will prove most generally interesting to English readers, but all, as will be seen, are worthy the attention of professors and students of music.

"Born a King."

An illustrated life of the baby-king of Spain—who is not yet six years old—is given us, under this title, by Frances and Mary Arnold-Forster, and published by Messrs. Cassell. How far the hopes of Spain are centred in this hitherto frail child-life our authors show us; and the interest with which news from his sick-room was awaited all over Europe during his illness two years ago ought to be a good omen for the popularity of this prettily-told tale of what is, we hope, but the beginning of a long life.

On Teaching Agriculture.

A text-book on agriculture, written by Dr. Henry J. Webb, B.Sc., the Principal of the Agricultural College, Aspatria, has just been added to Messrs. Longman's Elementary Science Manuals. Its author expressly disclaims any intention of teaching farmers their own business. His object is rather to put a text-book in the hands of young students and intending colonists, and, so far as we can judge, he has succeeded admirably. The advance in our educational methods is shown in nothing more than in our teaching of these special subjects. In this connection we may fittingly say that Messrs. Cassell also have just launched an "Agricultural Series," in which the first volume is "Farm Crops," by Professor J. Wrightson, the Editor of the series. This book should be in the hands of every rural schoolmaster and of all technical lecturers and teachers.

Judging by Appearances.

Our contributor, Mr. Henry Frith, who has already given us hand-books on the reading of character in the lines of the hand and in caligraphy, is responsible for a little book issued by Messrs. Ward, Lock, Bowden and Co., on "How to Read Character in Features, Forms, and Faces." "Every action of an individual," he says in his introductory chapter, "is characteristic of that particular individual, and indicates the character of his mind; it is the outward and visible sign of the inward spirit. . . . The gait, the mode of carrying the head, the movement of the arms, all indicate the manner of men we are, and all these traits must be studied from the living models we see every day." Now, despite the proverbial unwisdom of judging by appearances, there can be no doubt that our involuntary actions do afford some, and even to an extent reliable, data upon which to go in judging the character of those around us. The great danger is in "dabbling" in the art of character-reading and drawing definite conclusions in particular cases under what are only meant to be general laws. Take, for instance, the forehead as a typical feature from which to judge. "When we were young," says Mr. Frith, "a high forehead was always pointed out to us as a type of great intellect and natural talent. A low forehead was taken to represent a want of cleverness." Now he says "The reading man, who is stored with knowledge and who has the faculty for study, appears with a high forehead, the various bumps indicating his natural or acquired tastes. He is the compiler: the very industrious, well-informed man, a good preacher, perhaps, a man of cramming—full of information from reading, not *generally* from observation. The low, wide band of forehead is different in its signification. These foreheads are those of imaginative, brilliant, intuitively sharp, clever men, the writers of adventure and 'boys' literature. There is more natural talent inside the low forehead than behind the high one. The latter tells us of a talent for study." Mr. Frith honestly points out the limitation of the art he is describing, and the result is a work that is interesting, without being misleading.