

you wear them in England, say from 7 in. to 8 in. below the waist. If you are wanting such a garment, have a black jacket with a beige cloth waistcoat, braided in black.

Cloth dresses (for even in the height of summer there are days when you need them) have bell-sleeves with side revers. The favourite and newest trimming is a finely-worked appliqué of watered silk of the same tone. This forms wide open revers on either side of the front breadth, from neck to heel. The bodice has a waistcoat; the front of the skirt has two simple pleats on either side, turning towards the middle.

The under-skirts are edged with a fine kilting, and

have over that a wide gathered flounce a quarter of a yard deep, which serves to keep the over-dress out a little.

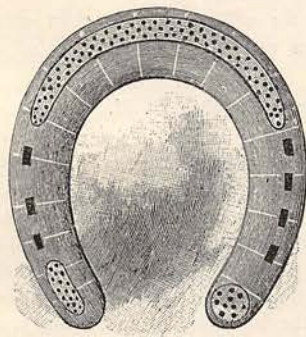
In Paris unmarried girls do not dress at all after the same style as matrons; and a pretty make of skirt for them is the accordion-pleating, arranged in honey-comb gathers to the depth of 4 in. below the waist. Long sashes are knotted at the side, generally of a contrasting colour, and the effect is graceful and pretty. The sleeves are full and so are the bodices; the shoulders can hardly be too high. Grenadines and barèges are coming to the fore again. They are useful, economical stuffs.

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.

An Elastic Horseshoe.



Mrs. A. M. Wood, the inventor of "Woodite," has introduced a new horseshoe, which deserves notice. It is made of "Whaleite"—an elastic composition—and besides wearing well, as far as has been tried, it has the merit of preventing the horse from slipping on

slippery streets or ice. Moreover, being elastic, it does not jar the legs of the animal so much as the hard iron shoe; and it can be cut to fit the hoof, instead of the hoof being cut to fit the shoe. It also allows of the free expansion of the hoof, and is calculated to prevent the prevalent diseases of horses' hoofs. The figure illustrates one pattern of the whaleite shoe.

A Self-supporting Photograph Mount.

A photograph mount which is fitted with a support, like the back-stay of an easel, is among the latest photographic novelties. The stay folds into a sunk cavity in the back of the card when not in use, so that the photographs may be utilised either in an album, or standing loose.

The Dark Flash of Lightning.

At a recent meeting of the Physical Society of London, Mr. G. M. Whipple read a paper on one of the mysteries of lightning—namely, the "dark flash" observed in some photographs of lightning.

This is a dark mark on the surface of the photograph, having all the characteristics of a lightning-flash, except that it is dark instead of light. Professor Stokes has suggested that it might be caused by one flash following another in the same path, and having the more refrangible rays of its light cut off. These are the rays which chiefly affect the photographic plate. The nitrous oxide gas formed by the decomposition of ammonia during the passage of the first flash might be the means of suppressing the rays in question. It has also been observed that several flashes do rapidly follow each other in the same path. But the matter requires further investigation, as does the whole subject of lightning, which is far from being properly understood.

The Telautograph.

Mr. Elisha Gray is a well-known American inventor and we have no reason to doubt the accounts received from America to the effect that he has devised a telautograph, or electric means of telegraphing a message in the sender's own handwriting. The apparatus consists of two writing-tables, one at each end of the line, which consists of two telegraph wires. Over these tables are two writing-pens in connection with the electric parts of the apparatus. One pen is for the person sending the message to write with, the other is for the automatic receipt or copying of the message sent. In moving his pen over the paper so as to form the letters, the sender, by means of metal brushes moving over contacts, interrupts two electric currents, one on each line. The current on one line is interrupted by the up and down strokes of the pen; the current on the other by the left and right strokes. The intermittent currents thus produced, after traversing the lines, pass through two sets of electro-magnets, whose

armatures they attract, and thus control the receiving pen. The intermittent currents follow each other so rapidly that the step-by-step motion of the receiving pen is hardly noticeable, and the copy of the writing is said to be very exact. The instruments having been supplied with paper, the operator takes the transmitting pen, and, holding it out of contact with the paper, moves it to the point over the paper at which he desires to begin writing the message. As the transmitting pen is thus moved one or both of the brushes is turned so as to interrupt one or both currents, and thus through the magnets and their armatures move the receiving pen to a corresponding position on the paper, the receiving pen being raised out of contact by a special pen-lifter. The operator then presses his pen on the paper as in ordinary writing, and the table being depressed closes a local circuit and brings the receiving pen on the paper. The operator then writes, and the receiving pen follows his movements by means of the electro-magnets, actuated by the intermittent currents. When the operator wishes to break off or go back to correct, he raises the transmitting pen from the paper. This allows the table to rise and the receiving pen to rise from the paper. By shifting to the desired point and lowering his pen, the operator causes the receiving pen to follow. When a new line requires that the paper be moved, the operator works a handle and shifts the paper. A transmitter and receiver are fixed at each station. In order to transmit diagrams, maps, or pictures, the transmitting and receiving pens are allowed a suitable range, but there is no other change required. A pencil or style may be used in place of the transmitting pen, and the letters merely formed, not marked. It is expected that the apparatus will be useful in business transactions, for any one can by its means be his own telegrapher.

An Automatic Chair.

The chair shown in our two figures is designed for public use in parks and promenades, and intended to

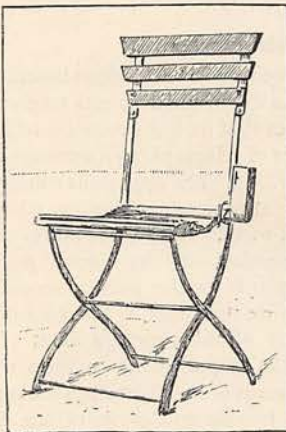


FIG. 1.

obviate the less satisfactory plan of employing collectors to move about and take the money. The bottom of the chair, as shown in Fig. 1, is, when not in use, folded against the back of the chair, where it is automatically locked. A penny dropped in the slit of the till seen at the side, unlocks the bottom, and the user is free to draw it down. When he leaves the chair the seat rises of its own accord and

locks itself; but if the user wishes to leave the chair, temporarily, he can prevent the seat from locking itself by means of a newspaper, stick, or umbrella. Fig. 2

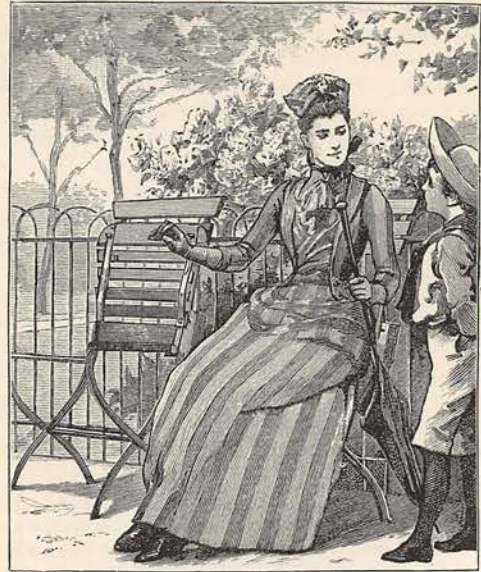


FIG. 2.

shows the seat in its folded position. While dealing with automatic apparatus we may also mention that a machine of the sort for selling liquids, even effervescent beverages, has recently been constructed in London.

A Makeshift Outside Blind.

Outside blinds are effective in keeping a room cool, as they prevent heating of the air within the glass. Where, however, an outside blind is not supplied to a window, a simple makeshift can be provided by opening the sash at the top, and putting the inside blind outside. In order to prevent the blind rattling, if there is wind, the tassel at the bottom can be brought into the room below, and the lower sash closed down on the cord to hold it.

A Curtain-Rod Holder.

An improvement in curtain-rod holders has just been patented that deserves the attention of housewives who love to have their windows neat. The sockets on which the rods rest are fitted on to a sliding rack, like the old-fashioned blind-cord rack, so that they may be raised or lowered at top and bottom to tighten the curtain, and so obviate that looseness which is so frequent with short curtains.

Elastic Sandstone.

In the Natural History Museum at South Kensington there is a small slab of bending or elastic sandstone; but this appears to be eclipsed by a specimen now in the office of the Clerk to the United States War Department, at Washington. It weighs about a pound, and is 13 inches long, 2½ inches wide, and ½ inch thick. When shaken in the hand it bends to and fro with a dull muffled sound. With the ends resting on props it sags an inch in the middle. Another

specimen of "itacolomite" or elastic sandstone is reported from California. It is 6 inches long, 1 inch wide, and $\frac{1}{4}$ inch thick, with shining specks of what seems to be mica scattered through it. Itacolomite is said to appear in diamond regions. It is stated that there is a whole mountain of it in Southern Nevada, east of Death Valley; but this requires confirmation.

Casting in Steel and Bronze.

The old Hindoo art of uniting different metals by casting has been revived in a Boston foundry. Steel and bronze are now cast together by casting the bronze parts of the object first, then cleaning them and placing them in their proper positions in a mould for the entire object. Molten steel is then poured in, and it unites with the bronze wherever it comes in contact with the latter.

A Spirit-Launch.

The illustration represents one of the "Zephyr" launches introduced by a well-known firm of launch-builders. It is 36 feet long by 6 feet in beam, and weighs, with its machinery, about a ton. In place of a steam-engine the motive-power is derived from petroleum spirit. The spirit, which has a specific gravity of about .680, is contained in a reservoir in the bows, while the other apparatus is placed aft. This consists of a coil of copper tube, having burners beneath. A small air-pump is employed to force air through the reservoir, where it is charged with inflammable vapour which goes to the burners, and, being ignited, heats the copper coils. These contain a quantity of the petroleum spirit, which is vaporised by the heat, and actuates the motor which drives the propeller of the launch. The waste vapour then traverses a pipe outside the bottom of the launch and is condensed by the cold water, to be returned for use again. It only takes two minutes to start the launch with this arrangement, and besides being cleanly, as

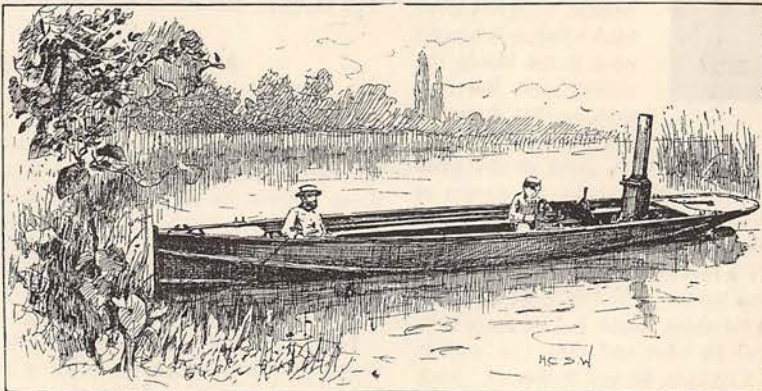
spirit gave 4,722 foot-pounds of work done, while steam only gave 2,524 foot-pounds.

A New Tubular Lock.

An improved lock has recently been patented which presents many advantages over the ordinary form of door-lock. The whole of the lock-case is contained in a cylindrical tube, an inch in diameter and six inches in length, and to fit this lock to a door all that is necessary is to drill a circular cavity with a screw-bit. As the space hollowed to receive the lock-case is so much less than with the old form of lock, the weakening of the door is almost done away with, and a very neat and strong lock is readily fitted. An incidental advantage in the use of these new locks is that the screws holding the handle-space for the latch may be much longer than with the old form, as they have the whole width of the door in which to bite, instead of the very thin piece left above the case in the ordinary form. This, of course, makes the handles much firmer. A template is supplied with each lock, that serves as a guide to the carpenter for boring the hole for the key and the handle, so that there is really no difficulty in fixing these locks very firmly and accurately with the minimum of cutting into the wood of the door.

The Buddhist Mounds.

Mr. J. M. Campbell, of the Bombay Civil Service, who some ten years ago opened a Buddhist mound at Sopara and discovered therein a crystal casket, containing what was regarded as a piece of the begging-bowl of Buddha, has recently opened another tumulus near Junagadh, in Kattywar, and found another relic. The barrow was nearly 90 feet high and 230 yards in circumference. It is thought to date from about 150 B.C., or some 450 years after the date of Buddha. The mound enclosed a stone coffer, containing a clay-stone chest, in which was a copper box, holding a silver casket, which in turn held a small round kernel



A SPIRIT-LAUNCH.

compared with coal and steam, the machinery weighs less. As regards economy, it was stated by Mr. A. F. Yarrow, recently, before the Society of Arts, that for an equal amount of fuel consumed, the petroleum

of gold, enclosing a tiny bowl and four precious stones, two bits of wood, and a fragment of bone, which Mr. Campbell considers to have been the special object of reverence.

A Convenient Window.

The form of window which we illustrate in Fig. 1 is designed to obviate some inconveniences attending the use of the ordinary window-sash which is hung by



FIG. 1.

ropes and weights. The sash is raised or lowered by means of a winch-handle, H, which turns a cogged pinion, working into a long screw, S, of high pitch, concealed in the side lining, as will be gathered from our illustration. By this means the sashes are easily

raised or lowered to any position, and will remain fixed there, though open. No fastening is required to keep the window shut, as it cannot be raised without turning the handle. Moreover each window is hinged on a frame inside the raising and lowering sash, so that it can be opened inwards after



FIG. 2.

the manner of a door, and both sides of the glass thoroughly cleaned, without the trouble or danger of any one going outside. Such a window is also more secure than the ordinary one, for it does not rattle in the wind. There is a recess behind the shutter, by which to operate the handle. In Fig. 2 we illustrate a new porthole light for ships, which has recently been brought out. It will be observed that the sash is hinged midway down so as to be well balanced. Such a light has the advantage of closing when struck by a heavy sea.

Measuring a Wave.

The Honourable Ralph Abercromby, while on board the steamer *Tongariro*, succeeded in measuring the height of ocean-waves by floating a sensitive

aneroid barometer upon the water. The width and velocity of the waves were also obtained by timing their passage with a chronograph. The biggest wave he encountered was in 55° S. latitude and 105° W. longitude. It was 46 feet high, 765 feet from crest to crest, and had a velocity of 47 miles an hour. As the weather was not exceptional for the latitude, Mr. Abercromby concludes that waves must occasionally reach a height of 60 feet, as has been stated by Admiral Fitzroy.

A Lethal Muzzle for Dogs.

Dr. Benjamin W. Richardson, F.R.S., the eminent physician, has invented a lethal muzzle for destroying diseased or mortally injured dogs in a painless manner. It is made on the principle of the well-known lethal chamber, and when put on, the dog in breathing dies painlessly.

Electric Tanning.

A process of tanning by electricity has been successfully working in France for the last six months, and special harness made from the leather is exhibited in the Paris Exhibition. The process consists in subjecting the hides to the action of a current of electricity while in contact with the ordinary tanning materials. A great saving of time is said to be effected, and the cost is reduced one-half. A company has been formed in this country to introduce the method.

A Benzine Carriage.

Carriages propelled by benzine motors are now made in Germany. The liquid fuel is placed in a closed copper vessel under the seat of the carriage, and passes drop by drop to a gas-generator which works a gas-motor and drives the carriage. The mixture of gas and air is exploded by means of an electric spark in the gas-motor. A quart of benzine is sufficient for an hour's trip; but a supply for a seventy-five-mile journey can be readily carried in the vessel. The carriage can run at a speed of ten miles an hour.

A Celluloid Slide-Rule.

A slide-rule, having the divisions on a veneer of dead-white celluloid, has recently been introduced. Mahogany takes the place of the ordinary boxwood. In other respects the rule is like that of Gravet, with some differences of detail. The divisions are clear, and the motions of the sliding part very smooth, while the price is less than that of the Gravet rule.

Singing Sands.

In one of the South Pacific Islands there is a small desert of sands, which, on being stirred by the trade breeze, emit a faint tinkling music, that has a soothing effect on the ear.

Clearing Rivers.

A plan now used in clearing rivers of weeds in France is deserving of report. It consists in fixing a series of V-shaped scythes at intervals along a chain,

so that the blades form an angle with the chain, which is drawn through the water by a windlass on a barge or boat towed from the banks.

The Blue of the Sky.

Some years ago Professor Tyndall made some beautiful experiments to show that the cerulean blue of the sky is caused by dust or impurities in the atmosphere. These particles are so small as to reflect only the luminous rays of short wave-length, that is to say, the blue rays. Professor Hartley has reinvestigated the subject, and found that ozone may have a good deal to do with the colour, since a small quantity of ozone in a glass tube two feet long produced a full sky-blue colour.

A Pocket Lamp.

The lamp we illustrate is designed for carriage in the pocket as a reading-lamp in travelling, or for use with microscopes and telescopes; and when fitted with ruby glass it is serviceable in photography. It is electric, the bulb having a silvered reflector behind, and giving a light of 1 candle-power. The accumulator which supplies the current is contained in the box, and consists of two cells, each composed of five plates. It is charged from an external source, such as a primary battery or dynamo, by inserting wires in holes at the side. The charging current is half an ampère for eight hours, and the lamp takes 0.35 ampère, and gives a light for six hours. A switch, having a resistance of 1 ohm, is worked by turning a milled-headed screw, thus regulating the



intensity of the light, and putting it out or in by degrees. The lamp was recently exhibited at the conversation of the Royal Society. Its weight is 1 lb. 13 oz., complete.

A Fire-Damp Meter.



FIG. 1.

Davy lamp. The fire-damp heats the platinum and sends up the mercury in that thermometer, and the instrument is graduated to show by the rise of the mercury the percentage of fire-damp present in the air. Of course, the wire gauze is to prevent the heated

platinum from igniting the inflammable atmosphere around the apparatus. Fig. 1 shows a form adopted for hanging on the wall; and Fig. 2 one made like a watch. It is proposed to employ a form of differential thermometer for the purpose of these meters. In this there would



FIG. 2.

be a tube with two bulbs containing air, and the bend of the tube would be filled with a column of mercury. One of the bulbs would be surrounded with spongy platinum, which, heated by the fire-damp, would expand the air in the bulb and shift the mercury column in the bend, thus indicating the percentage of inflammable gas. Mr. Niblett thinks that instruments showing a percentage of 5 to 15 will be the most useful in collieries.

Gas as a Cautery.

Dr. B. W. Richardson, F.R.S., has recently suggested the use of compressed gas as a cautery in surgical operations. It is known that a jet of compressed gas impinging on the flesh produces an injury like a burn; and accidents of this kind happen to workmen from time to time. Dr. Richardson proposes to remove warts and pendulous growths by this means. It would be less alarming than the knife or hot wire, and is for the moment painless, the intense cold acting as an

anæsthetic. Chlorine, or better still, carbonic anhydride are the gases he would use, being manageable, cheap, inodorous, and unflammable. It can be used in an artificial light. It is to be hoped that Dr. Richardson, who, we believe, introduced ether spray as a local anæsthetic, will succeed in giving the suggestion practical effect.

A New Garden Sprinkler.



A new head for garden hose is shown in our illustration. Without the necessity of making any change in the fittings it is possible to produce at will, by a simple turn of the collar, a light or coarse spray or a heavy jet, the advantage of which will be readily apparent to gardeners.

This form of water distributor admits of ready graduation, so that the requirements of individual flowers or plants may be met as the gardener goes about his work. The pin, which is shown on the collar of the fitting in our illustration, serves as the indicator, and as it is moved from right to left in its aperture, the force of the spray is increased until the pin reaches the extreme left, when the full power of the jet is called into play.

Henry the Seventh.

The latest addition to Messrs. Macmillan's "English Statesmen" series, is Mr. James Gairdner's "Henry the Seventh." Perhaps the work is to a greater extent a history of the period covered by the life than some of its predecessors have been, but of its interest there can be no question. That it is, at the same time, scholarly and thorough, no one who knows Mr. Gairdner's work—and especially his work on this particular life and period in the "Rolls" series—can doubt. The fact that the lives of these "Statesmen" are not published in strictly chronological order makes it easier for the reader to grasp the importance of the characters, as they are dealt with, and helps to clothe the dry bones of valuable historical teaching with the human interest of biography. We may mention here that Messrs. Macmillan have just issued an admirable little French reading-book for young scholars, entitled "French Life in Letters," written by Mrs. Molesworth, and accompanied by excellent notes on the idiomatic and difficult words and phrases.

For Readers, Young and Old.

Of European Powers, perhaps there are no two whose movements and developments are more keenly watched

than Germany and Russia, nowadays. It is important, therefore, for every one to know something of the people who go to make up the power of these two States, and if this can be learned in youth, much after misconception may be avoided. Messrs. Cassell have just issued a new edition of two works intended to give this information: "Chats about Germany," by Maggie Browne, and "All the Russias," by E. C. Phillips. These handy little books belong to the same series as the "Ramble Round France," to which we alluded last month, and are equally well adapted to fulfil their purpose of at once instructing and interesting young readers. Older readers will, no doubt, be interested in a new work, just issued by the same publishers, on the much-debated question of "Cremation and Urn-burial," in which the question is looked at more from an æsthetic point of view than a sanitary one, by Mr. W. Robinson. On the merits of the question itself, we express no opinion here; but there can be no doubt of the antiquity of the plan which the author advocates, and our readers who desire fuller information on the subject, should certainly study his fully illustrated little book.

East London at a Glance.

Without attempting to deal as a whole with Mr. Charles Booth's stupendous work on East London—the first, we believe, of a series on "The Labour and Life of the People," to be published by Messrs. Williams and Norgate—we should like to draw the attention of all our readers to the map which forms so valuable a part of the work. It is worthy the most careful study, and will go far to remove many preconceptions as to the people of the East End. The carefully gathered data as to the occupations and life of the inhabitants of every street, which have been so admirably used in the body of the work, are, as it were, epitomised on this map. Dotted over its surface will be found streets and parts of streets—often only a single block of tenements—coloured black, and these are the quarters occupied by the "very poor, lowest class—vicious, semi-criminal." And we believe many of our readers will be surprised to see how small a proportion these plague-spots bear to the mass of more brightly coloured streets, the actual numerical proportion being indeed only 1·3 per cent. of the population. Of the eight classes into which Mr. Booth divides East-Londoners, the largest, by far, is that comprising working men earning wages sufficient to secure ordinary comforts for themselves and their families, and this class contains 44·3 per cent. of the whole population of the district. Highly-paid labour numbers 12·5 per cent., the lower middle class 3·3 per cent., and the upper middle class 1·6 per cent. of the whole. Taking four of Mr. Booth's eight classes, as including those whose lives are passed in poverty, and the other four as including those whose lives are passed in comfort, we find that the first group comprises 38·3, and the second 61·7 per cent. of the population. Mr. Booth's work will do much to enable philanthropists and legislators to understand the actual facts of the situation they must cope with.