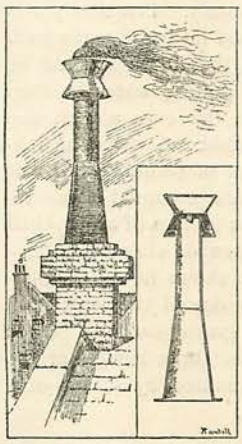
THE GATHERER:

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 New Chimney-Pot.



A really good chimney-pot for the cure of smoky vents is a desideratum. That called the "Venetian" has many points in its favour, and is well worthy of the attention of builders and householders. It has none of the objectionable features of the cowl. It does not revolve or creak, it is quite open to the sweeper's broom, and it presents a neat appearance. As shown in the accompanying section, it consists of two cones, the lower tapering and creating the up-draught, the upper inverted over the lower, and deflecting the wind upwards instead of downwards, thus preventing gusts of smoke. The slope of the upper cone is such that a wind striking its inner surface at an angle not exceeding 36° with the horizontal is deflected upwards and outwards. The total height of the new chimney-pot is 4 ft. 6 in., and it is made in galvanised iron, zinc, terra-cotta, clay, or other material.

Rathite.

Bicycle tyres and railway buffers of pure india-rubber are too soft, and hence a new compound termed "rathite" has been introduced. It is a compound of vulcanised rubber and silk fibre in a finely divided state, and is said to combine toughness with durability.

Ammonite.

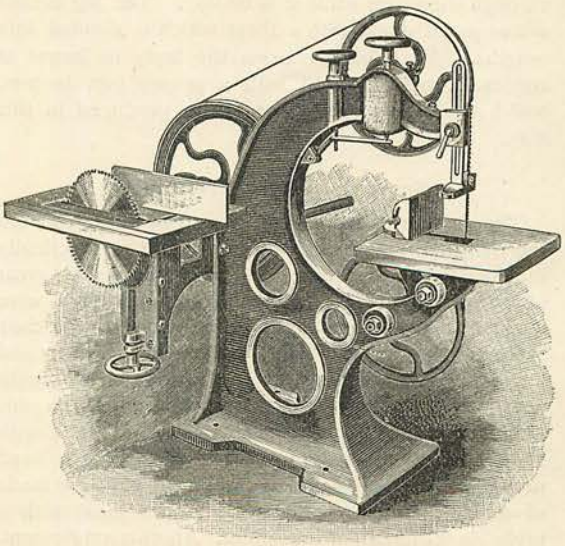
The new explosive called ammonite is intended to prevent explosions in collieries, and consists of pure ammonium nitrate and nitro-naphthaline, which, after being dried and ground, are mixed at a moderate heat. The result is a yellow powder, which is made into cartridges. It is more powerful than dynamite, a charge of five grammes projecting a shot of twenty-nine lb. from a mortar to a distance of 320 yards, whereas the same quantity of dynamite only sent it 289 yards, while an equal amount of gunpowder only carried it 136 yards. It does not explode under concussion, and is quite safe in handling and transport so long as it is not detonated in the regular way.

Invisible Writing.

Sympathetic inks are well-known, but a recent discovery of Professor Bruylauts of the University of Louvain surpasses them, inasmuch as no ink at all is required in order to convey a secret message. He lays several sheets of note-paper on each other, and writes on the uppermost with a pencil, then selects one of the under sheets on which no marks of the writing are visible. On exposing this sheet to the vapour of iodine for a few minutes, it turns yellowish, and the writing appears of a violet-brown colour. On further moistening the paper it turns blue, and the letters show in violet lines. The explanation is that note-paper contains starch, which, under pressure, becomes hydramide and turns blue in the iodine fumes. It is best to write on a hard desk, say a pane of glass. Sulphurous acid gas can make the writing disappear again, and it can be revived a second time.

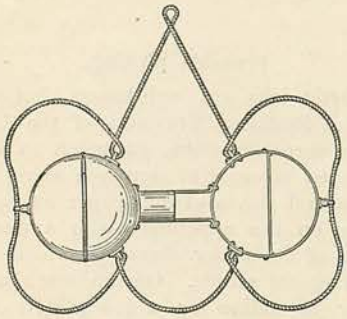
A Band and Circular Saw.

The machine shown in our woodcut is a combined circular and band saw for the use of wood workers of all kinds. The band saw which is seen on the right will cut straight, irregular, or curving lines, and the table may be canted to any angle for bevel-cutting. This saw can also be fitted with a "fence" for cutting



tenons. Provision is made for the expansion and contraction of the saw blade during the work. The circular saw has a "rise and fall table" for sawing, rebating, and grooving, so that there is no need to alter the length of the shelf connecting the saw to the motor. These saws are made both for hand and engine power.

A Copper Life-buoy.



The life-saving appliance illustrated in the figure is a hollow, copper dumb-bell, which acts as a float, and to which the becket-lines are attached in loops. The right half of the figure shows the buoy in section, and the stiffening partition inside the bell. As the connecting bar is also hollow, there are five water-tight compartments in the apparatus. The buoy has only one-third the weight of an ordinary one, and it can be thrown more easily. We may add that it has been sanctioned by the Board of Trade.

Casks without Staves.

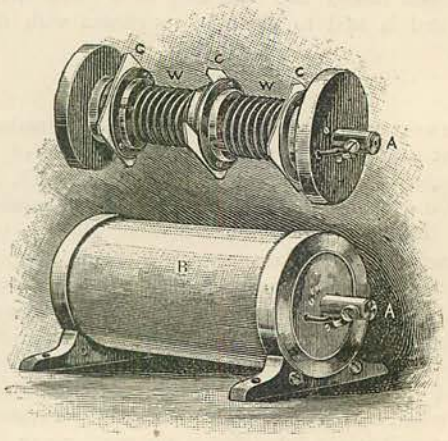
The body of barrels is now made in one piece cut from the tree, so that there is only one joint in the whole. The tree trunk is first sawn into lengths which are boiled for three hours in a closed vessel and thus softened. A current of electricity is also passed through the water while it is boiling. The log is then cut or pared down into a sheet which is divided into lengths. Each length forms the body or barrel of the cask, and is fitted with a proper top, bottom, and hoops. Some fine veneers are produced in this way.

Some Interesting Novelties.

The amount of exercise which can be extracted from the well-known game of "cup and ball" is practically inexhaustible. But there has always been one great objection against the game hitherto—children were constantly doing damage, either to their person or their surroundings, with the hard wooden balls. A new and hygienic variant of the old game has now been brought out under the title of "the Dorothy," in which the cups are much larger than was customary of old, and with shorter handles, so as to bring the player's hand nearer to the bowl of the cup, while the balls are made of wool. The result is a capital indoor game with a probable minimum of breakages. Another amusement, which, at the same time, affords occupation for little fingers and an opportunity of imparting instruction, is to be found in the washable "Natural History Pictures," recently introduced, and which are to be stitched carefully on to Turkey twill or any other washing material. In the course of this work, and the subsequent making-up of the pictures thus mounted into cot-quilts, nursery curtains, or table-cloths, it would be at once natural and easy to say a few words about the animal whose picture was being outlined or mounted, and little ones may thus be taught *natural* history as well as needlework. "The Teaette" is the name given to a new utensil for the making of a single cup of tea quickly and purely. Practically it is a spoon with a lid, both bowl and lid being perforated. The tea is placed in the bowl, the lid is secured by means of a sliding ring, and if boiling water be then poured upon the "teaette" in the cup, a fresh cup of tea would be quickly available. A calendar ink-stand is one of the most recent of combinations. It consists of a case, in which are mounted three revolving barrels that serve as the indices of a perpetual calendar, whether the box is open or closed; while a chart on the back of the case shows how the apparatus may be used to find the day of the week upon which any particular day in a given year fell. When the box is opened each of the three barrels of the calendar is found to be surmounted by an ink-well, for black, red, and copying ink.

A Lightning Guard for Electric Installations.

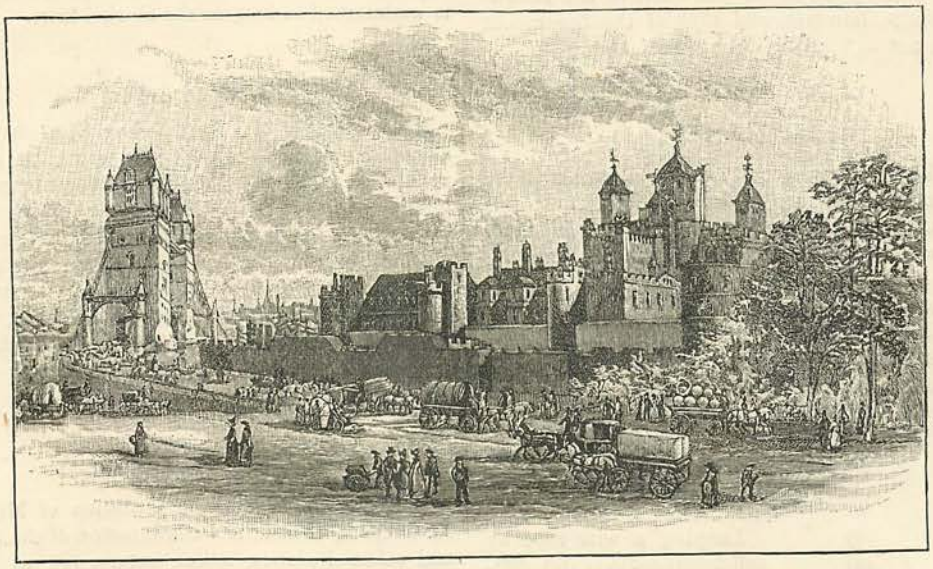
Dr. Oliver Lodge, F.R.S., has designed a little apparatus to protect electric light installations from lightning. It is illustrated in the figure, and consists of a cylindrical barrel, B, through which the current passes by the axis, A, and two coils of thick wire, W, W. At equal intervals in the circuit of this wire are three pairs of brass collars, C, C, C, having squares of mica, coated with tinfoil, between them. The corners of the foils come near to the metal barrel or case of the apparatus, which is connected to the earth. Should lightning enter the coil, it will leak away or branch off by the tinfoils and escape to the ground.



We understand that Major Cardew has tested this protector in the laboratory of the Board of Trade and found it satisfactory.

The Tower Bridge.

This remarkable structure, which, it is expected, will be finished next year, was begun by the Corporation of the City of London on June 21st, 1886, the Prince of Wales laying the foundation-stone. The Thames at this point is 880 feet wide, and the bridge consists of three spans, namely, a central of 200 feet, and two side ones of 270 feet each, which, together with piers and approaches, brings its total length to 2,640 feet.



THE TOWER BRIDGE AS IT IS EXPECTED TO APPEAR WHEN FINISHED.

To allow of ships going up and down, the central span is built on the *bascule* or drawbridge principle —the two halves of the spans being hinged at the piers, and capable of being raised into a vertical position, then lowered into the horizontal position after the vessel has passed through. This arrangement will only stop the vehicular traffic from time to time. The foot passengers will cross the river by a lighter bridge, raised to a height of 135 feet above the river on the lofty middle piers. The shore spans are devised on the suspension principle, and the central span will consist of iron girders; while the piers are built of grey granite, and the upper parts of the middle towers of red brick, with stone facings. The working of the drawbridge will be effected by hydraulic power—all the engines being duplicated in case of a breakdown. It is expected that about two dozen ships will pass the bridge daily, each occupying five minutes, but, as most of these will come "on the top of the tide," there will be long intervals of closure. The roadway is sixty feet wide, narrowing to fifty feet at the middle span, and the gradients are nowhere steeper than a rise of one foot in forty feet—that is to say, the slopes are flatter than those of London Bridge. The architect of the work is Mr. Horace Jones, and the engineer is Mr. John Wolfe Barry.

Hidden Energy of Ether.

Scientists of the newer school are coming to regard the luminiferous ether which pervades the material universe, and is the known vehicle of light, as well as of electric and magnetic induction, as an illimitable and inexhaustible reservoir of energy, which is ordinarily concealed from our senses, but can be guessed at from the power of a lightning stroke or an explosion. In fact, we seem to be living in the midst of the most violent and disruptive forces, which, nevertheless, appear to have no existence because they are so finely balanced. Mr. S. Tolver Preston, an able thinker in this field, has recently calculated that every cubic foot of ether contains within itself 10,700 foot-tons of energy, that is to say, it is capable of lifting a ton to the height of 10,700 feet, or more than twice the altitude of Ben Nevis. The energy stored in $2\frac{1}{2}$ cubic feet of ether is equivalent to that of an express train weighing 300 tons and running at a speed of 60 miles an hour. The pressure exerted on matter by the ether surrounding and bathing it is, he estimates, no less than 500 tons on the square inch.

Aërated Milk.

Milk separated from its fat or butter and aërated with carbonic anhydride by Crampton's process is recommended by the medical faculty for invalids whose digestive powers are unable to assimilate it in its natural state. The milk for treatment in a separator is placed in siphon bottles and the gas is forced in at a pressure of eighty pounds to the square inch. It is drawn off for use like soda-water.

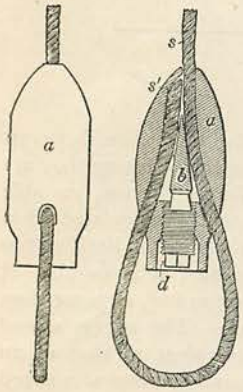
Spring Water Gold.

The famous Mount Morgan gold mine in Queensland, which has been so profitable turns out to be a geological curiosity. The gold appears in a silicious sinter which covers the slopes and forms the core of a hill. The sinter has been deposited from a hot mineral spring in the course of ages, and the gold is found in deposits of brown ironstone or hematite occurring in the sinter. According to a recent analysis by Mr. W. H. Weed, of the United States Geological Survey, the sinter is a pure form of opal, like that of the Yellowstone Park, and the auriferous hematite, also deposited from the ancient spring, by cooling of the overflow, is like that of the Steamboat Springs of Nevada. Gold does not seem to occur in the Yellowstone Springs, however, and that of the Steamboat Springs is not in "paying" quantities.

Trains and Birds.

Mr. Pilkington has recently drawn attention to the destruction of birds and insects by railway trains in motion. The front of a locomotive is frequently covered with dead insects and stained with the blood of birds which have been flying across the line. Grouse and partridges, startled by the noise are often sufferers from this cause, being either killed or maimed. Mr. Pilkington once saw a fine grouse lying wounded on a locomotive where it remained during 100 miles of the journey.

A Wire-rope Holder.



Looping a wire rope by splicing is tedious and difficult, hence the device which we illustrate. By its means a loop can be made in a few minutes by an unskilled workman. The holder is a cast-iron block, A, with four holes in it, the rope, S, being passed through the block and out by one of the holes. The end is then bent round to form the loop, and passed through the other side hole, then out at the top. A cast-iron wedge, B, fills up the tapering space, and is driven home by a screwed plug, D, thereby gripping the rope so tightly that it cannot be drawn out. To prevent the rope from wearing, the inside of the block is lined with galvanised iron, which can be renewed when worn through.

A New Cautery.

A permanent thermo-cautery, recently described to the French Academy of Sciences, is illustrated in the figure. It consists of a spherical boiler B, into which is introduced a quantity of alcohol by the stopper D. The vapour of the alcohol, mingled with

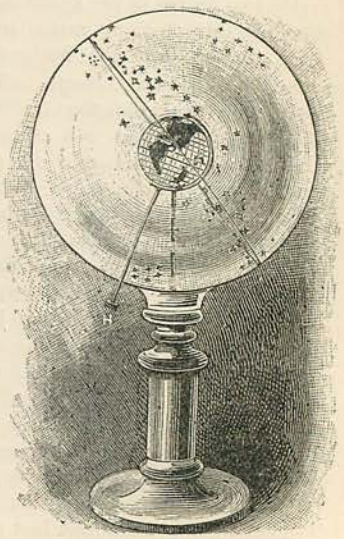
air, passes by internal tubes to a ribbon of incandescent platinum, which heats the point P of the cautery. The apparatus can be used with one hand, and the heat is maintained as long as the alcohol lasts.

Music in Sickness.

The Guild of St. Cecilia has been founded by Canon Harford to apply soft music as a remedy in illness to soothe the mind, alleviate pain, and induce sleep. Tests will be made of its power in various cases by musicians provided for the purpose; a central hall is to be erected in London where music of a high class will be audible day and night, and records will be kept of the results achieved. Already the work of sending musicians to hospitals and infirmaries has begun, and the scheme has met with distinguished approval.

The Geodoscope.

This new apparatus, the invention of Miss Annie M. Gregory, L.L.A., is a combination of the terrestrial and celestial globes, which cannot fail to be useful in schools and colleges. The merit of the device consists in surrounding the terrestrial globe with a celestial globe of glass, marked with the principal stars, the signs of the zodiac, the ecliptic, celestial equator, and the tropics. The earth is rotated by means of a handle, H, projecting through this crystal shell, and all its phases are visible to the eye. The earth is a three-inch globe, the heavens a twelve-inch globe. A cylindrical beam of light reflected from a hand lantern represents the sun, and by its rays falling on the earth gives a perfect illustration of the day and night throughout the year.



A Deck-seat Lifeboat.

A combined lifeboat and deck-seat which attracted a good deal of notice at the Naval Exhibition, is represented in the accompanying woodcuts, of which Fig. 1 is a plan, and Fig. 2 a longitudinal section. The lifeboat is 20 feet long, 5 feet in beam, 2 feet deep, and

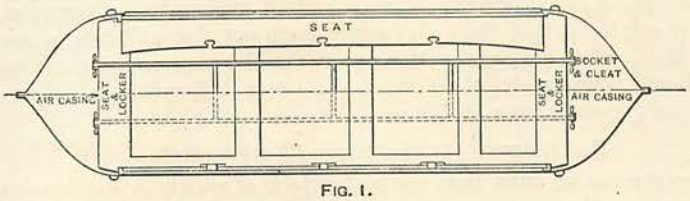


FIG. 1.

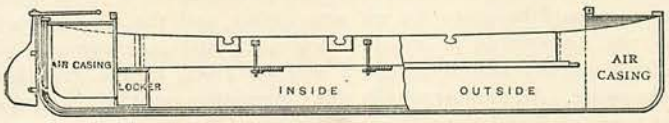


FIG. 2.

capable of holding 15 persons. Air-casings are provided at each end and along the sides, to give the required buoyancy ; the bottom is flat, and fitted with side-keels.

Gift Books and Others.

A little time ago we heard the complaint made that "Robinson Crusoe" was *too long!* But the critic had passed his boyhood, and must have formed his heterodox opinion before their new fine-art edition of Defoe's undying work was published by Messrs. Cassell. It is issued at a price which makes it generally available as a gift-book or prize, and it is profusely and carefully illustrated by Mr. Walter Paget, whose work is familiar to all readers of "CASSELL'S MAGAZINE" in connection with our current serial story, "Out of the Fashion." To run through this handsome volume is sufficient to bring back to recollection half-forgotten incidents of the story, that is so old but yet so perennially fresh. From "Robinson Crusoe" to a new encyclopædia is a long cry, but we have before us the first volume of one issued by the same publishers, handy in form and yet comprehensive in scope. It is "Cassell's Storehouse of Information" which promises to be fitted for general reference and yet not to be either bulky or expensive. The articles are not always short, and they are so fully illustrated that the work ought to meet all ordinary demands, seeing that it is at once accurate, and brought down to date. The sixth volume of Cassell's "New Popular Educator" fully sustains the reputation which its predecessors have made for the work. This edition, so thoroughly revised and re-written, is a vast improvement on its useful forerunners.

Fairy Tales from the Greek.

Mrs. Edmonds, who has translated the "Stories from Fairyland" to make a volume of Mr. Fisher Unwin's quaintly-dressed Children's Library, speaks almost apologetically in her preface of any association of the word "Fairy" with Greek tales, inasmuch as fairies, as we know them, are strangers to the Greeks. But a "fairy tale" without fairies, paradoxical though it may sound, is hardly a novelty among more northern folk, and these stories, translated from Drosines and Kourtidos, well deserve inclusion in this admirable series. There is something at once pleasing and fresh about them that will commend the tales to all readers, old and young alike.

"The Great Commoner."

When an ex-Foreign Secretary writes of a former Premier, the ordinary reader feels that the work is, at any rate, in the hands of a man who is bound to be fully alive to all the influences which play upon a statesman in and out of office. The Earl of Rosebery's contribution to the series of "Twelve English Statesmen," edited by Mr. John Morley, for Messrs. Macmillan, is a sketch of William Pitt's career that is highly creditable to the author and to the memory of the great man of whom he writes. The life-story of the man who held supreme power in England when the events of the American War of Secession still exercised a potent influence on English politics ; who held the helm in the storm that followed the French Revolution, and through the troublous times of the first war with Napoleon, the Irish Rebellion, and the passing of the Act of Union, has yet to be told. In the compass of a volume of less than 300 pages Lord Rosebery cannot, of course, be expected to supply this undoubted want, for which, as he points out, the time will not come until at least the State papers of Pitt's day are published. But of Pitt the man—apart, to a large extent, from his policy and its causes—Lord Rosebery presents a most admirable study. When all the streams of Pitt's policy and the tendencies of his statecraft have passed from the domain of politics to that of history—and that day is not yet—we shall be better able to judge of Pitt, the statesman, as he really was. Pure, earnest, strong, and full of faith in his country, Lord Rosebery shows him to us.

"Pleasant Work for Busy Fingers."

This is a work at once practical and entertaining. It gives full directions for quite a host of indoor amusements and occupations that are suited for little fingers. Paper-folding and cutting, paper-pricking and sewing, and beadwork are only representative of the different classes of pastimes that Miss Maggie Browne, the author, treats of. She gives as a sub-title to her work "Kinder-Garten At Home" and a happier description of her well-illustrated volume it would be impossible to find. Parents owe the author and publishers (Cassell & Co.) a considerable debt of gratitude for this volume.