THE GATHERER:

AN ILLUSTRATED RECORD OF INVENTION, DISCOVERY, LITERATURE, AND SCIENCE.

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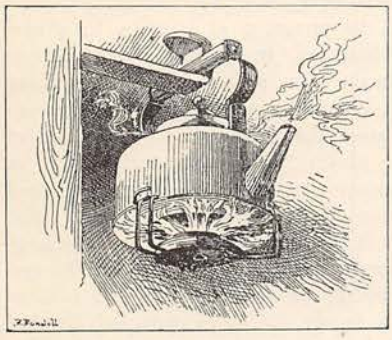
A Stove Kettle.



A kettle to which a little stove can be attached at will is illustrated herewith. The kettle has a concavity in the bottom, into which the convex spirit lamp, seen beneath, fits when not in use, and draws out (as shown) when required to boil the kettle. Owing to the enlarged heating surface the kettle boils very quickly, and hence is useful for tourists or emigrants.

Oolite Marble.

Soft oolitic limestone, or limestone with spherical granules, is now hardened into marble by treatment with a certain chemical solution, which gives to the stone a thick, strong skin, about half an inch deep, capable of a fine polish. Soft oolite can thus be worked into any form, and hardened afterwards. The marble becomes impervious to damp and atmospheric influences.

The Speed of Fishes.

The fast fishes, according to Professor G. B. Goode, are of pointed build with close-lying fins, and are frequently predacious. Food fishes, on the other hand, are often slow, and easily caught, but are correspondingly prolific. The actual speed of fishes is not as yet well known ; but as dolphins have been observed to swim round and round a steamer going at full speed, their pace is estimated at twenty miles an hour or more. The Spanish mackerel is one of the fastest of the food fishes. Its body is conical, and smooth as metal, while in its motion it cuts the water like a yacht.

Irrigation Colonies.

Two irrigation colonies have been started on the river Murray, in South Australia and Victoria. The soil and climate of these regions are both good, but the rain-fall is deficient ; and this has been supplemented by irrigation works, drawing supplies of water from the river. The water is raised to a height of eighty feet by steam-power ; and the forests of the district supply the fuel. The crops will be, in the main, of garden produce, such as fruit, melons, and the like. The engineers of the works have already established an irrigation colony in California, which has now 2,500 settlers. There is a thriving town upon it, with churches, banks, hotels, and schools, while outside the town the orange-groves and vineyards are smiling with flowers and fruit. The Australian colonies at Mildura and Renmark are at a considerable distance from large towns ; but in a few years there will be a railway all the way.

Extending Ladders.

Ladders capable of extending telescopically from 20 feet to 36½ feet, or any intermediate height, have recently been introduced. These ladders have been adopted in the British Museum for getting at the specimens.

A Constant-Level Inkstand.

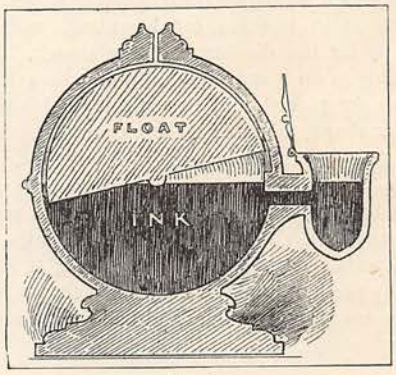


FIG. 1.

The "Isobath" inkstand, which keeps the ink at a constant level for the dip, will be understood from Fig. 1, which is a section through the apparatus. In the reservoir is a float, so poised as to sink on one side as the ink is used, and thus maintain the level in the outer well, at the side into which the pen is dipped. The reservoir contains about ⅛ of a pint of ink, and being closed up prevents dust from getting to the latter, as well as excessive evaporation. That petty trouble of writers, an ill-fed pen, is avoided by this device, which is turned out in a great variety of patterns, one of which is shown in Fig. 2.

FIG. 2.

A Kneading Machine.

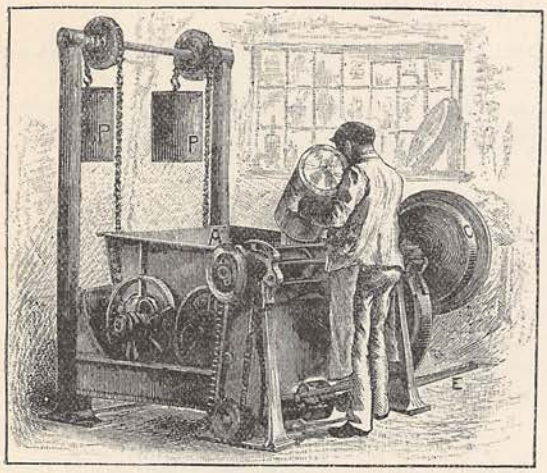
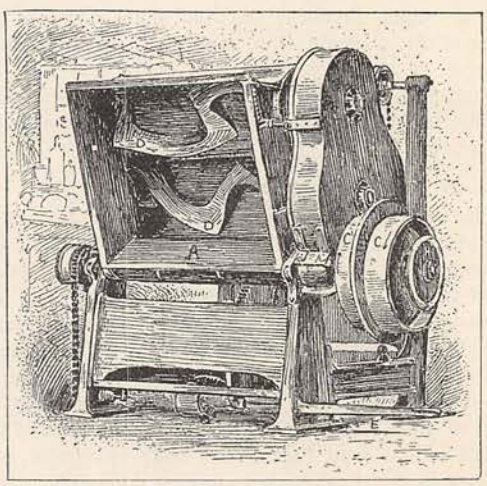


FIG. 1.

A kneading and mixing machine for making dough is illustrated in the accompanying figures. It is capable of kneading the dough to any degree of stiffness, whether it be required for bread or cakes. Fig. 1 represents it in position for kneading, and Fig. 2 as tilted up for the discharge of the dough. It consists mainly of an iron trough, A, into which the flour and water are placed, and two revolving blades, D D, of angular shape, mounted on axles, which by suitable toothed gearing revolve at dissimilar speeds. These axles are drawn either way by belts on the pulleys C C^1. A hand-wheel, H, beside the pulleys, serves to stop or regulate the motions of the blades. The tilting is performed by means of the lever E, which is worked by the foot, and the counterweights P P. The machines are strongly made, and will stand considerable rough usage.

Novelties for Home Use.

All who have experienced the difficulty of providing for the lighting of an invalid's room, where illumination is often required suddenly and for a few minutes only, will be glad to hear of a new apparatus named the "Aurora," that has been devised to meet their wants. It consists of a specially designed stop-cock, that is screwed on to the gas-fitting immediately below the burner, and connected by cords, running through staples easily driven into the walls of the room, with the bed-side. The stop-cock is so made that the supply of gas is never absolutely cut off, and so the light may be raised and lowered at will by merely pulling one or other of the handles attached to the ends of the cords. Another appliance for the sick-room is an ingenious arrangement for fixing to the neck or stopper of bottles containing poisonous medicines. To the clip that fastens this little device to the bottle is secured a tiny bell, waving freely on the end of a loosely coiled spring, and which serves to warn the attendant, who may take it up in the dark, of the dangerous nature of the bottle's contents. But, while quite sufficient to answer this useful purpose, the tremulous tinkle is not strong enough to disturb a patient. Perfumes are now being made up in a new form—ammoniated, so that when first applied to the handkerchief they possess all the reviving qualities of ammoniated salts. After the ammonia has evaporated, which it does very rapidly, the perfume remains. Ladies who suffer from headaches will be glad to hear of this refreshing and attractive novelty. Passing to the quarters of those who are, happily, not in need of either of the preceding novelties, we may call the attention of smokers to a new pipe called the "Roll-call," in which a roll of absorbent paper is coiled in the stem, with the object of drinking up the noxious juice, and so guarding the smoker from one of the greatest dangers attending the use of tobacco. Chess-players, and particularly lovers of problems, will welcome a new pocket-board invented by an old devotee of the game, Mr. Livesey. The principal novelty in this new pocket convenience is in the men, which are made of stamped metal, and hinged above the pins by means of which they are held in position on each square, in holes provided for that purpose. For playing in railway trains and under similar circumstances, the fact that these readily portable pieces actually stand up from the board in which they are carried, is a great gain. As, without taking them from their places, all the pieces in use may be folded down flat, to admit of the board's being closed, this device seems admirably adapted for the working out of problems.



A KNEADING MACHINE.—FIG. 2.

The Touraco.

The crimson feathers of the touraco or plantain-eater of Africa are said to be coloured by a red pigment which washes out, and hence the bird conceals himself under thick foliage during rain. The fact has been doubted; but Professor Church, of the Royal Agricultural College, extracted a red colouring matter from the feathers, to which he gave the name of turacine, and which was found to contain copper. Quite recently, Mr. F. E. Beddard, prorector of the Zoological Society, obtained a pink solution from the

feathers of a dead touraco, by steeping them in ordinary tap-water. There are a number of these interesting birds now at the Zoological Gardens in London.

A Cabbage-Strainer.

By means of the simple device shown in our engraving, the water from boiled cabbages can be quickly strained away, and the vegetable pressed into a compact and ornamental shape for the table.

A New Smokeless Gunpowder.

Captain Noble, of Elswick, has, it is stated, succeeded in preparing a really smokeless gunpowder. The material is greyish in colour, and in the shape of cords or threads. Its constitution is not made public, but its smokeless character is well attested, and the bullets can be seen to strike the target.

The Night Sky.

A chart of the heavens containing some twenty million stars up to the fourteenth magnitude is now in course of preparation, and will be finished in three or four years. The work is, of course, international —a large number of observatories having combined to do it. Part of the expense will no doubt be redeemed by the sale of the star maps, which will have an historical value for posterity, since the aspect of the heavens is slowly changing with the course of time.

A Self-acting Fog-Signal.

According to the regulation a going vessel in a fog must sound either a horn or a whistle once every two minutes. If a vessel is at anchor she must ring a bell once in the same period. In order to effect this automatically, an ingenious electrical contrivance has recently been introduced which not only controls the blowing of a steam-whistle or fog-horn when the ship is moving, and the ringing of an electric bell when she is at anchor, but also makes a register of every sound, on a band of travelling paper kept under lock and key, so that in the event of any dispute as to the signalling the record can be consulted. The register is, in fact, an automatic log-book of the fog-signals. The apparatus consists essentially of three parts : a switch to enable the self-acting signals to be started when the ship is going, or when she is at rest ; an electro-magnetic device, actuated by the current from a small battery, for working the whistle or horn, and ringing the electric fog-bell ; and, lastly, the registering apparatus, which is formed of a wide band of paper, graduated according to time, and moving by clockwork, so that when a signal is sounded, the current which controls it registers the fact on the paper by puncturing a hole in it. This is done by the agency of a small electro-magnet, which forces a needle-point into the paper as the latter passes slowly under it. Of course, the self-acting apparatus can be eliminated at will by means of the switch, and the signals sounded whenever the navigating officer wishes by simply pressing the push-buttons provided. In this case the electric current still effects the signalling, but not automatically. Obviously, this arrangement is very convenient, since it allows the attention of the navigator to be free and untrammelled. So many collisions occur during the winter fogs, that there is evidently something imperfect in our present system of voluntary signalling, and an automatic apparatus is well deserving of attention.

Two More International Exhibitions.

The opening of the Forth Bridge is to be celebrated by an International Exhibition of electrical and general engineering in Edinburgh. Ground has been secured at Merchistoun—a convenient site—and the works are now in progress. The Glasgow Exhibition was a conspicuous success, and there is every reason to believe that the Edinburgh one will not be far behind, though it will probably be laid out on a smaller scale. Highland games and other sports will form the outdoor attractions of the Exhibition. In the Emperor Gardens at Cologne a Domestic Exhibition of an international character has already been opened. It will comprise everything useful in the home, and will doubtless be visited by many English tourists passing through the city. In addition to apparatus and devices of a mechanical kind, foods, drinks, clothing, furniture, the fine arts, and games are among the subjects to be represented.

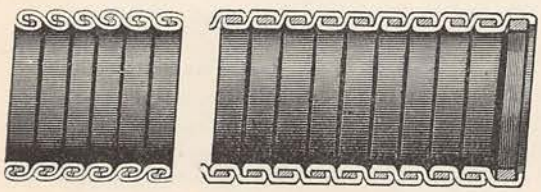
An Electric Table-Lamp.

The new battery invented to propel the Renard-Krebs dirigible balloon is now applied to domestic lighting. It is constructed of a platinised silver foil

bent into the form of a tube, which contains a zinc rod inside. The zinc is the positive, and the silver the negative element of the cell. They are both immersed in a solution of chromic, hydrochloric, and sulphuric acids, the whole being held in a glass vessel. Our illustration represents a table-lamp of 25 candle-power, fed by seven Renard cells joined in series, and capable of giving a current of four amperes at eleven volts for five to eight hours, that is to say, for one supply of the solution. The battery is contained in the base of the lamp, and the whole thing weighs about thirty-five pounds. In order to remove the spent solution, which is capable of use as a disinfectant, the upper part with the lamp is removed, and the liquid forced out by means of a collapsing aspirator.

Flexible Metal Tubes.

A flexible metal tube capable of conveying water, steam, and gas, has recently been introduced into the United Kingdom from France and Belgium. It can be made to bear a severe pressure without bursting,



and at the same time weighs no more than india-rubber tubing. The engravings show two sections of the tubing as it is constructed. A strip of metal, which can be either brass, bronze, gun-metal, or galvanised steel, is fed through rollers which bend it into an S or "double-channel" pattern. It is then wound on a mandrel so that the edges interlock as shown. A strip of india-rubber, asbestos, whip-cord, or cat-gut is laid in the bend to secure a good tight joint. The right-hand figure represents a pipe made to withstand high pressures, say from ten to a thousand pounds per square inch. The left-hand figure represents a pipe of more compact frame, designed for low pressures, and having two strips of the jointing material. This latter form is suitable for a suction hose. For light pressures the lengths of piping so made are coupled together by solid "unions" into which the ends are screwed and soldered. For heavier pressures the pipes are joined in a "nipple" and carefully packed with asbestos. The pipes are made in sizes from ¼ inch in diameter to four inches or upwards, and they have been well tested in practice.

Brine and Sewage.

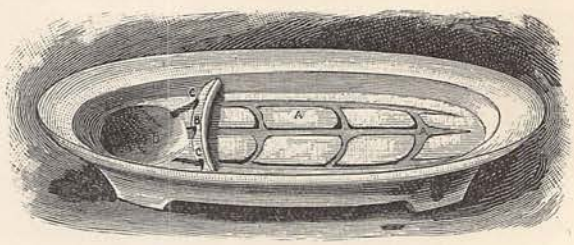
On the 18th of September last, at Wimbledon Sewage Farm, the amines process for disposing of the sludge of sewage was publicly tried. It consists in mixing amine salts with lime and blending this with the sewage. At Wimbledon the amine salts were obtained by mixing lime with herring brine. The lime is decomposed by the brine, yielding a soluble gas, which the inventor, Mr. Hugo Wollheim, calls aminol. This gaseous reagent is a powerful disinfectant, destroying all microbes capable of producing disease. The disinfecting mixture is mingled with the sewage as it issues from the sewers, and, by the action of the lime, there is a tendency for the suspended matters to subside, whilst the putrid odour of the sewage gives place to the briny smell of the reagent. The sewage is then allowed to flow into settling-tanks, where the solids subside and the water is run off. The sludge is collected, pressed, and formed into blocks. The water and sludge are both innocuous, and may be used for agricultural purposes, the one as a liquid, the other as a solid fertiliser.

Magnetic Adhesion.

When a piece of iron is attracted to a magnet it is inclined to stick there, and adhere to the poles of the magnet as if it were attached by some invisible mucilage. This magnetic adhesion has recently been applied to increasing the grip of the iron wheels of a railway carriage on the rails while ascending a steep incline. A dynamo and engine on the locomotive were caused to generate a current, which was made to magnetise the tires of the rear driving wheels. By attracting the rails, the effect was the same as if sand had been strewed on the latter to increase the grip of the wheels. These experiments were carried out on the Trackville line, in America, at a point which rises 185 feet in the mile. It is stated that the train completed the ascent in twenty-eight minutes, whereas without the aid of magnetism it would have taken fifty-five minutes. It is to be hoped that the experiments will be pursued, because the device, if properly applied, may be useful in obviating the services of an extra engine on wet inclines. While upon this subject we may mention that it is also proposed to dispense with "fiddles" on the tables of ships in stormy weather, by attaching an iron disc to the bottoms of dishes, and attracting them through the boards by electro-magnets under the table. The suggestion is ingenious, but whether it will be realised on a general scale is quite another matter.

A New Well-Dish.

Our engraving shows a dish in which the well, D, for the gravy is separated from the receptacle, A, for the meat by a bridge or partition perforated with three



holes, C B C. By this device the meat is prevented from splashing into the gravy during the carving. The bridge is curved so as to hold the meat in its place, while the holes allow the gravy to reach the well.

A Pocket Sun-Dial.

Portable sun-dials, consisting of metal rings, carried in the pocket like a watch, were made and sold in Sheffield during the last century, when watches were

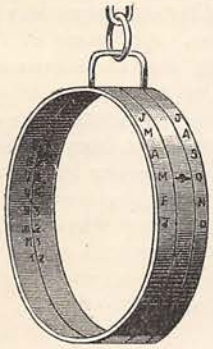


FIG. 1.

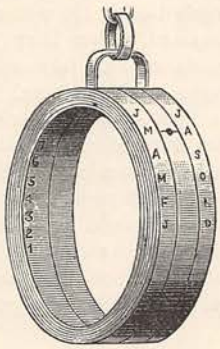


FIG. 2.

expensive. Fig. 1 represents one of these devices, which was held vertical by the chain, and turned towards the sun, so that a ray of light piercing the small hole seen on the middle of the ring between M and O would fall on the opposite scale inside and mark the hour. It did so by the altitude of the sun in the heavens, instead of by the shadow cast, as in the ordinary sun-dial. Of course, the higher the sun the later it was in the forenoon, and the earlier in the afternoon : hence the hours are marked so as to run down from five to twelve o'clock (noon), and up again to seven at night, as shown. Since the position of the sun varies with the month, the hole had to be shifted from month to month ; and so it was cut in a sliding ring which could be moved round to bring it opposite the month, as marked on the outside with its initial. Thus, starting from the lower J (January), the letters run up to J (June), and then descend to D (December). These old sun-dials are probably scarce, but can be constructed by amateurs, out of either brass or Bristol board, as in Fig. 2, where several layers of cardboard are used to impart stiffness. A small plummet can be added inside the ring to secure verticality.

Two New Card Games.

"Military Manœuvres" and "The House that Jack Built" are the titles that Messrs. Hamilton, Hills & Co. have given to some new round games that they have just published. While they are quite within the grasp of children, there is plenty of amusement to be drawn from these original games by those of larger growth. During the holiday season they ought to prove very useful. The same publishers have sent us some new Christmas and New Year's Cards, admirably entitled "Unique," in which the ideas are strikingly fresh and taking. They reach us too late for detailed notice, but all who love novelty should see among them the Mexican Feather Cards.

"The Story of Music."

In his "Story of Music" (Longmans), Mr. W. J. Henderson gives on the whole a very fair, though somewhat meagre, outline of the course of musical art in the Christian Era ; we wish, however, he had accorded a better recognition to English art and artists, and had provided an index to the contents of the volume. Possibly "The Story" was not intended for serious study, and may profitably wile away an hour or two as an ordinarily readable book.

New Volumes.

The second volume of the revised "Popular Educator," which has just been issued by Messrs. Cassell, carries on the course of instruction inaugurated by its predecessor. The lessons in drawing and music are especially good in this issue, while those in languages and shorthand are also very practical. No family should be without the volumes of this work. The third volume of "Cassell's Illustrated History of England" covers the eventful period from the Great Rebellion to the fall of Monmouth. Mr. Railton's charming pictures of historical scenes, as in the two former volumes, give an added value to this edition. The powerful figure drawings by the Messrs. Paget and Mr. Blair Leighton, too, should prove a useful acquisition to any teacher of English history, where pictorial aid will often serve to impress the actual circumstances of the storied incident on the student's mind.

Something to Sing and Play.

Mr. Erskine Allon's music is good, solid, and clear, though often, perhaps from over-elaboration, his work is more interesting to read than attractive to hear. This is the impression left upon us by his "Second Sonata in G minor," which has just been published by the London Music Publishing Co., though even in this Sonata the fourth movement may probably be taken as an exceptional piece of work. The same publishers have just issued a useful collection of original and selected part songs arranged by Mr. Frank Swift, under the title of "The Garland of Gems." The collection ought to prove useful to teachers and for home use. Of "Two Songs" composed by our contributor, Mr. R. E. Bryson, and issued by the London Music Publishing Co., the second, "The Storm Wind," is quite a gem. From Messrs. Hutchings & Co. we have received a very good song entitled "Voices of the Air," which is a fairly attractive setting (for either a contralto or mezzo voice), by Mr. J. L. Roeckel, of words by Mr. Clifton Bingham ; and an effective ballade for pianoforte, by Ignace Gibsone, "The Two Voices." This latter is an easy piece with a well-written cantabile melody. The banjo is becoming so popular as a drawing-room instrument, that we are glad to welcome from Mr. Alphonse Carey the "Popular Banjo Album," which contains a goodly number of suitable and well-arranged pieces both for solo and concerted performances. A good violin solo from the same publishers is E. Polonaski's "Romance sans Paroles." It would be difficult to find a better or more helpful "Pianoforte Primer" than a new one which has just been issued by Mr. Carey.