

## BIRDS OF THE MONTHS.



APRIL—LARK.

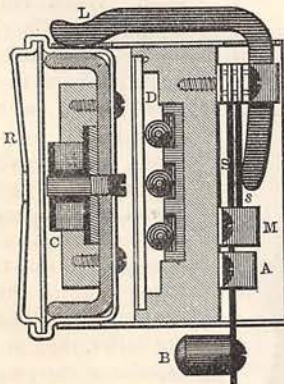
REJOICING bird! whose wings have cleft the  
blue,  
And those far heights of morning sky have  
scaled!  
Youth loves to watch thee, but with sighs watch those  
Whose wings grow wearied, and whose hopes have  
failed.

## THE GATHERER :

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

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## The Button Telephone.



ing the receiver, R, closing the front of the case. This consists of a Bell telephone, with coil and magnet, C, behind an iron diaphragm, as usual. When the receiver is removed and held to the ear for listening, the transmitter is exposed for speaking to. It

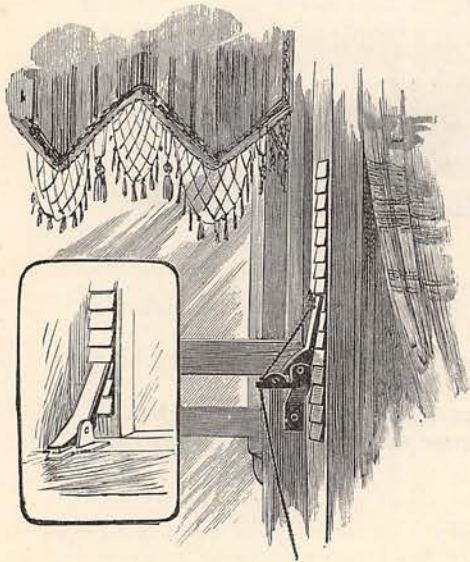
consists of a carbon diaphragm, D, with three carbon balls in carbon sockets, which touch it from behind. This forms a handy microphone. At the back of the case is a switch for sending the current through the call-bell or the microphone. It consists of two metal springs, s s, insulated from each other, and two copper pieces, M and A. A push-button, B, serves to ring the call-bell of the distant station; and a bell is connected beside the instrument for the home call. When the apparatus is at rest the receiver closes it like a cover, and the bent lever, L, presses the spring, s, into contact with the spring s, thus allowing the call-current from the distant station to ring the home call-bell. The operator then responds by pressing the button, B, thus making contact between the spring s and the piece A, and ringing the distant bell. He also removes the receiver, R, and holds it to his ear, thus allowing the upper part of the lever, L, to fall down; and the spring s, now released, makes contact with the piece M, putting the current through the microphone, and enabling the operator to reply to his correspondent. When the talk is finished, the



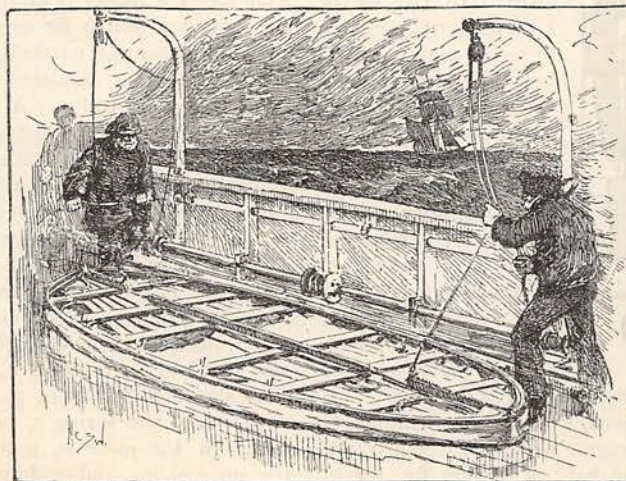
apparatus is again put in readiness for the next call by simply restoring the receiver to its old position as a cover to the instrument. Such an apparatus is likely to be useful for communicating between the different rooms of a house, or the offices and workshops of large premises.

#### A New Sash-Fastener.

Our illustration shows a new sash-fastener which has just been patented. As will be seen, its action



is very simple. The fastener consists of a cant-lever working automatically against a toothed rack. The lever is fixed to the top of the lower sash, and falls by its own weight upon the toothed rack, and if any attempt were made to open the window, the top of the lever would be pushed home in the rack, and the window remain immovable. When it is desired to open the window, all that it is necessary to do is to lift the lever by means of the thumb-spring attached to it for that purpose, and the window may then be opened to the extent required. When it is desirable to leave the bottom sash open for a little way, the lever may be allowed to fall against one of the upper teeth in the rack, and it will be found impossible to open the window further without lifting the lever, which can only be done from inside. For



A COLLAPSIBLE BOAT (FIG. 2).

windows where the bottom sash is of such a height as to place the thumb-spring out of easy reach, its place is taken by a simple cord attachment, shown in our illustration.

#### The Electric Light in Ice.

At the Cincinnati Centennial Exhibition there was an interesting exhibit of electric incandescent lamps frozen into blocks of ice. The ice was frozen round the bulbs by the Cincinnati Ice Company, and aniline dyes were infused into the water as it was freezing, so as to give the ice a variegated effect, which, when lit up by the lamps within, was exceedingly pretty. At the same exhibition artificial flowers made of incandescent lamps were, we understand, also exhibited.

#### A Collapsible Boat.

Figs. 1 and 2 illustrate a new collapsible boat, which attracted much attention at the recent Glasgow International Exhibition. The boat is so designed that by the simple operation of hoisting it by davit, in order to lower it, the true form (Fig. 1) is taken and made rigid for immediate use. A lifeboat of



FIG. 1.

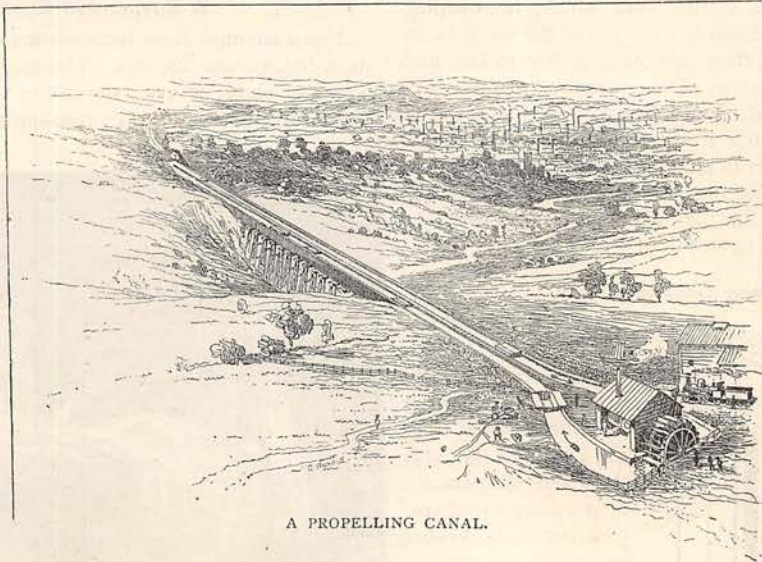
this description, made in accordance with the Board of Trade regulation as to size, weighs only 11 cwt., as against 45 to 50 cwt. in the case of an ordinary lifeboat. When collapsed (as in Fig. 2) its height is only 10 inches; and five such boats, with oars, masts, sails, water, and provisions, can be stored in the space occupied by an ordinary lifeboat. Being lighter in construction than the latter, they are capable of carrying more passengers. The skin is made of canvas, and the boat is seaworthy in a heavy sea.



### A Propelling Canal.

A canal which not only floats a vessel, but propels it, has been designed by Mr. Pickard, and, if introduced, will effect something like a revolution in this branch of engineering. The idea is to split the water-

current of electricity was sent through the rod to heat it up red-hot. Different substances such as hydrocarbon liquids, silica, and so on, were placed round the rod, and the whole subjected to a pressure of five to thirty tons on the square inch. The "diamond



A PROPELLING CANAL.

way into two channels—one for going, and the other for returning vessels. By means of a screw-propeller fixed at one end of the canal or section of the canal between these channels, the water is set in motion, and a current flows up one channel and down the other, carrying as many vessels with it as there is room for. In this way a constant train of craft, laden with freight or passengers, can glide along without the use of horse or other haulage, and even without attendants. Proper sidings would permit them to be loaded and unloaded. In the case of a canal divided into sections at different levels, there would be no need for locks and the delay they occasion, for the vessels could be guided on to tramways, and hauled from one level to the other, where they would again be moved by the flowing tide. Our illustration shows a model of this ingenious canal, with its two channels, its common propeller, and the vessels floating on it. We may mention here that it is now proposed to turn the existing Forth and Clyde Canal into a ship canal, enabling vessels to sail between the two rivers.

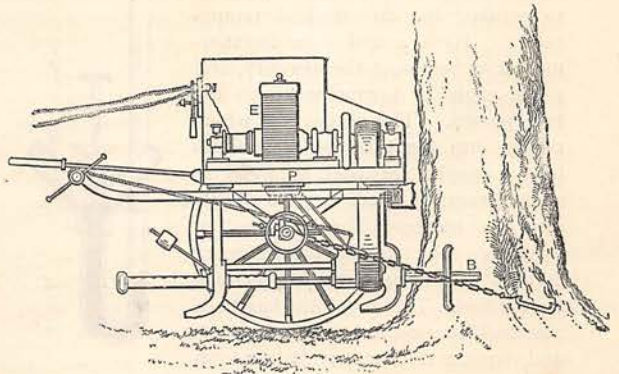
### Making Diamond Dust.

During the course of some experiments recently made by the Honourable C. A. Parsons for the purpose of discovering a mode of manufacturing hard carbons for electric lighting, a quantity of carbon dust, harder than emery, and capable of scratching diamond, was fabricated. It is thought that the dust is itself a form of diamond. The experiments consisted in enclosing a carbon rod or pencil in a steel cylinder capable of withstanding great pressures. A powerful

dust," if it may be called so, was formed under this pressure with a current of 200 to 300 ampères flowing through the rod, which was about a quarter-inch thick. Lime, silver-sand, and coke dust surrounded the rod within the cylinder. The dust in question was of a grey colour, so is the layer of dense hard carbon formed on the outside of a carbon filament for an electric incandescent lamp. The experiments of Mr. Parsons were communicated to the Royal Society.

### Felling Trees by Electricity.

Machines for felling trees which are worked by steam have the disadvantage of not being capable of action in all circumstances, especially in thick woods. As electricity can be taken in wires through the thickest grove, the application of this power is more convenient. Hence the electric tree-feller, which we





illustrate, has been brought out by a well-known firm of electrical manufacturers of Buda-Pesth, Hungary, and is in use in the Galician forests. It consists of an electric motor, *E*, which is carried by a cart, *P*, and actuates, by means of suitable gearing, the cutting tool, *B*. The cart is brought up close to the tree, and the cutter is put in operation. The latter consists of a cutting drill which, in sweeping from side to side, removes a section of the trunk in its path. The cutter then advances a few inches, and the next stroke removes another section. In this way the trunk is severed, clamps being applied to keep the cut open. When the trunk is so far severed that it would be dangerous to make another sweep, the rest is cut by hand. The cart is kept in position by clamping it to the tree in the manner shown; and the whole apparatus is lighter than a steam-saw.

#### A New Gas-Regulator.

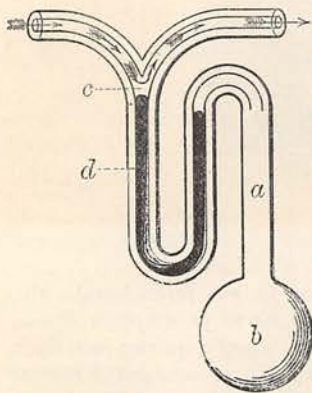


FIG. 1.

The figures illustrate a simple and ingenious apparatus, invented by Mr. George Rothnie, for regulating the supply of gas, and thus the temperature of greenhouses, offices, or apartments, heated by liquid or gaseous fuel. Fig. 1 explains the principle of the regulator, which consists of a thermometer or thermostat, formed of a bulb, *b*, containing air or other fluid which expands with heat. The tube, *a*, has a double bend in it containing mercury, *d*, which, when the air in *a b* expands, is forced up the tube, so as to partially close the turnpoint, *c*, and cut off the supply of gas or flowing fuel passing in the direction of the arrows towards the stove or burner. By this means the temperature of a room can be kept even. Another form of the apparatus is shown in Fig. 2. It is designed to enable the user to set the instrument to regulate for any desired temperature. Here *a* and *b* are the thermostat as before, *d* the mercury, and *c* the angle or turnpoint which the fuel passes. The screw, *f e*, which passes into the tube by a stuffing-box, *g*, can be regulated by hand so as to penetrate more or less deeply into the mercury, thus raising or lowering the top of the mercury column and regulating the passage for the fuel. This regulator has been successfully used for some time past, and requires no attention, while from

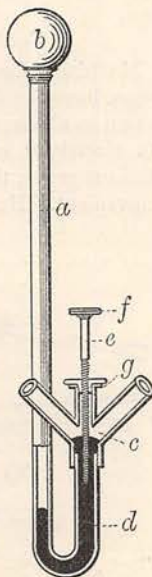


FIG. 2.

its simple and inexpensive character it is unlikely to get out of order. The form shown in Fig. 2 can also be used for controlling the height of gas-flames, and raising or lowering the light to any desired degree of illumination. The tube can either be made of glass or some metal, such as iron, which is unattacked by mercury.

#### A Suspended Berth.

Many attempts have been made to prevent sea-sickness, but without success. The reason is that though a bed, or chair, or even the entire saloon of a vessel, be swung so as to keep its position with regard to the



vertical, that will not stop the translation of the occupant either up, down, or along. Nevertheless, it is something to have a berth which will keep the horizontal, and such a one is illustrated in the accompanying figure. It is suspended from ball-and-socket joints, supported by two brackets, attached to athwart partitions of the vessel. The berth hangs by a system of levers, designed to compensate for change of level due to pitching, the swing itself correcting that due to rolling. A wire frame above serves to support a coverlet as a canopy, thus preventing the occupant from seeing the moving walls of the ship. To keep its movements within bounds two pairs of springs connect the bottom of the couch to the floor. One is a weak spring, the other strong, and the latter only comes into play after the former has been extended to the full. This berth has been tried on several voyages; and as it is a safeguard against both pitching and rolling, it is a decided improvement on the ordinary hammock.

#### A Paraffin Photometer.

Mr. Joly, M.A., has devised a new photometer of a simple but effective character, which is capable of comparing ordinary white lights with great accuracy. It consists of two parallelepipeds of paraffin wax, with smoothly-planed sides, placed together with the plane of the junction cutting the line joining the two lights at right angles. Each light shines through the



paralleloiped which is nearest it, and illuminates the translucent material. When the intensities of the two lights are equal, the line of junction disappears; but when the lights are unequal, the plane of division in the compound paralleloiped becomes visible. The object of the observer is therefore to move the paralleloiped between the lights until both halves of it appear equally luminous, and the dividing plane is lost to sight. Translucent glass, similar to the paraffin in its effects, is also used as a more durable material. Such a photometer has the rare advantage of being portable, and easy to use.

#### The Obolette.

This is a "fancy title" for a new musical instrument recently invented by Mr. Matthias Barr (well known as a contributor to our pages in times past). The instrument is made partly of wood and partly of metal, and its tone is of the flageolet order, but very mellow, and capable of considerable expression. The "obolette" has a large compass, with all the chromatic intervals; and the manipulation is strikingly simple, as there are no complications of "keys," the semitones being produced by means of convenient side-holes for the thumbs and little fingers. This instrument should become very popular.

#### An Adjustable Drawing-Table.

The figure illustrates a new drawing-table, which can be regulated in height to suit the stature of the draughtsman and the work to be done at the time. To this end the top is balanced like a window-sash by flexible cords passing over pulleys and carrying counterweights. The top is kept in position by means of slides; and the screws seen at the front are for regulating the height. Any slope can be given to



the board by a simple arrangement in front. As the health of draughtsmen sometimes suffers from their having to remain so long in one position, the new table is to be recommended, as it allows them to vary their position.

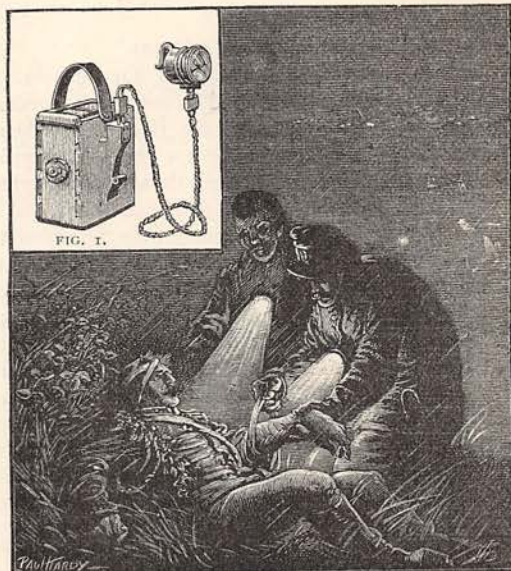


FIG. 1.

#### The Electric Light and Ambulances.

Some interesting experiments were recently made on Hampstead Heath by the officers and men of the London Division of the Volunteer Medical Staff Corps, an organisation which consists largely of medical students. The corps, under Surgeon-Commandant Norton, accompanied by ambulance waggons, halted on one of the Heath roads at night in a thick mist, and, after establishing a field hospital in a sheltered part of the ground, sent out searching parties, provided with small electric hand-lamps of the kind manufactured now by a number of makers, such as Swan, Pitkin, and others.

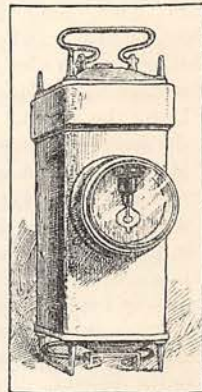


FIG. 2.

The object was to discover wounded men in the darkness, and not only did they succeed in finding those who played this part, but they found that preliminary bandaging could be performed by means of the electric light. An advantage of this light is that it can be held very close to the thing under examination without difficulty. The electric lamp seems well adapted for ambulance purposes. Figs. 1 and 2 illustrate two recent forms of these electric hand-lamps. In the case of Fig. 1 the lamp itself is detached from the battery, which is contained in the box beside it, two insulated wires twisted together conveying the current to the incandescent lamp. The latter is seen in the face of the box,



which has a hook on the back to catch in the button-hole, if necessary. Fig. 2 shows the incandescent lamp and its filament still better. In the former case the light is started by pressing the button seen on the side of the box, and in the latter case by simply turning the box and battery upside-down.

#### "Musicians of All Times."

Mr. David Baptie has compiled for Messrs. J. Curwen & Sons a concise dictionary of musical biography, to which he gives the title at the head of this paragraph. Though by no means bulky in form, the volume contains no less than 12,000 entries. So far as we have been able to check the work it is very accurate, and is evidently brought down to a very recent date. In a work of such dimensions mistakes are almost inevitable, and Mr. Baptie tells in his preface of two eminent musicians who died, one about four years ago, and the other only about as many months since, yet in each case there are three different dates assigned for their birth. If there is such uncertainty with regard to those who are our contemporaries, how can we wonder that Mr. Baptie and others should find it difficult to procure reliable information when they are dealing with the biographies of past generations?

#### Some New Music.

Lovers of Mr. Sydney Smith's music will find in "Arlequin et Columbine" (E. Ascherburg & Co.) one of the most attractive of his later works for the piano. Three easy and melodious little violin pieces by Guido Papini are—"Sérénade Italienne," "Dolce far Niente," and "Lily of the Valley," issued by the same publishers, who also send us a clever and original setting (with violin obligato) by F. Allitsen of some words of Victor Hugo's, translated under the title of "Unto thy Heart." From the same composer and publishers we have a pretty little soprano song, "Marjorie," with a captivating refrain. Messrs. Duff & Stewart send us, under the title of "Le Thiere's Duets for Violin and Piano," a set of pretty and simple pieces of moderate difficulty, and in "Rondo Villageois," one of Hummel's most useful pieces, carefully fingered and well printed. Well adapted for teaching purposes is the "Family Circle" series (same publishers), where the music, supplied by Mr. Walter Brooks, displays far more skill and taste than is usual in pieces of this calibre. We welcome also a reprint from Messrs. Duff & Stewart of Field's well-known "Rondo in E flat," a composition marked by his best characteristics.

#### All about London.

"The Metropolitan Year-Book" (Cassell) is a new *vade-mecum* for all who are in search of information about the metropolis. Its information is not such as interests Londoners alone, but will be found valuable by those whose connection with the metropolis is mainly of correspondence. Information will be found within its pages concerning such miscellaneous matters as cab-fares, societies and institutions, picture galleries and public libraries, places of worship, and a very full

account of every department of municipal government, including even the recently-elected School Board, and County Council for London. It is impossible within the limits of a brief paragraph like this to do more than indicate a few of the most prominent items of interest in this volume, which should be in the hands of all who do business in London or with Londoners.

#### Songs New and Old.

Mr. Lancelot Martley has been very successful in his setting of "Five Songs," by Thomas Moore, issued by the London Music Publishing Company, each one of which is perfect in its way, and the collection comprises songs suitable for either male or female voices; the accompaniments are strikingly beautiful. The same publishers send us an original and pretty pianoforte solo by Erskine Allon, "Rustic Suite;" a song of considerable merit by our contributor, Mr. R. Ernest Bryson, "How have I thought of Thee?" and a very good part song for four voices, by Erskine Allon, entitled "Valerius' Song." "Re-united" (Hart & Co.), a song to which the music is supplied by Torriano, does not seem to us to possess any feature which raises it above the commonplace. Messrs. Hutchings & Co. send us a very pretty little gavotte by Charles Le Thiere, entitled "La Cloche d'Argent," and two pianoforte pieces—the first "Der Kleine Tambour," by R. W. Oberhoffer; and the second "Un Rêve d'Innocence," a pretty drawing-room piece by Hamilton Croft. Two other songs from the same publishers are Miss Annie E. Armstrong's setting of Charlotte Bain's "Not at Home!" a bright and pretty rendering in Scotch style; and "Old Time and the Maiden," in which Mr. Richard Harvey gives us some very pretty music.

#### Two New Dictionaries.

A new German Dictionary, which is at once handy and complete, has just been published by Messrs. Cassell. In size it is somewhat larger in page than their well-known French Dictionary, and is so arranged as to include within its eleven hundred and odd pages many chapters and tables of words admirably adapted to lighten the task of a teacher, or to help a scholar who is endeavouring to teach himself.—Mr. E. J. Wall's "Dictionary of Photography" (Hazell, Watson, & Viney) is intended for the use of those amateur photographers who have not access to, or do not possess the facility for using, the many text-books that are required for the study of the different branches of their art. The chapters on lenses, and indeed all the optical departments are very good. Development and toning are also dealt with in very able articles. The swing-back is disposed of, however, in the absurdly-limited space of fourteen lines, and only two more lines are given to the important branch of micro-photography; and surely the wet-plate process deserved better and more thorough treatment than Mr. Wall gives to it. But the good points in this work so far outweigh those in which it seems to us weak, that we can heartily commend it to the attention of those who propose to take up the fascinating art of photography.