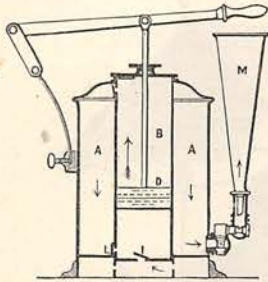


THE GATHERER.

A Mechanical Fog-Horn.

A continuous fog-horn which is blown by mechanical means has recently been introduced to our notice.

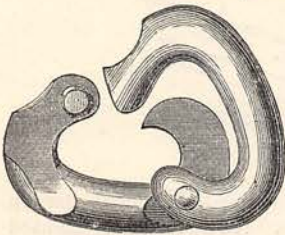


From the annexed diagram its mode of action will be readily seen. It consists of a cylinder, A, in which stands a concentric cylinder, B, wherein a piston, D, can be moved up and down by the hand-lever shown. This cylinder forms a double-action pump. When the piston is raised, air is forced through the top valve into the annular chamber, A, which serves as a receiver of compressed air; when the piston is lowered, the air admitted below it by the valve, I, is also compressed and driven into the chamber, A, through the valve, L. By this means a constant supply of dense air is kept up in the receiver, and can be let off by the fog-horn, M, which can be pointed in any direction by turning it on a universal joint.

Asbestos Board.

The new uses of asbestos are many and various, one of the latest being a species of boarding made from it, and used as a foundation for dynamo-electric light machines, among other applications. The board can be made of pure asbestos, but to render it more insulating and solid it is steeped in melted ozokerit, or "black earth wax," a species of wax paraffin from which candles have been made. This millboard of asbestos and ozokerit is also a cheap substitute for ebonite in certain electrical apparatus, such as the vessels for voltaic batteries or accumulators. Gloves of asbestos cloth, lined with india-rubber to render them waterproof as well as fireproof, are being manufactured for the use of electric light engineers, to guard their fingers from sparks and accidental shocks in handling electric lamps.

A Handy Chain Link.

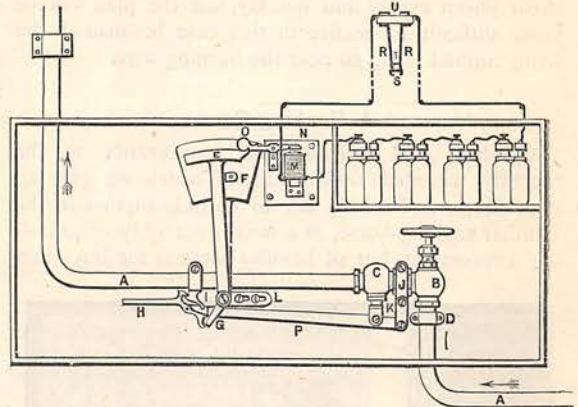


A useful link for repairing broken chains is shown in the accompanying figure. As will be readily seen, it is composed of two half-links pinned together so as to be easily opened and closed—the shape of the divided part converting it into a spring fastening.

A Self-acting Fire-Extinguisher.

An ingenious system for extinguishing a fire by means of water has been devised by Mr. Maxim, the

well-known inventor of an electric lamp. As applied to theatres it consists of a series of water-pipes under the stage, and communicating with the mains of the town. Ordinarily these pipes are filled with compressed air; but by means of stop-cocks, closed by strings, the outbreak of fire is made to liberate this air and allow water to take its place. This is done by the fire burning the strings and opening the stop-cocks. To cause a discharge of water at any given point, Mr. Maxim employs combustible strings which act as fuses to a small quantity of explosive material placed in a cap closing the stop-cock. When fired the explosion blows off the cap and allows the water to escape. A better plan, however, is his electric system, which will be understood on reference to the annexed diagram, where R R are two metal springs separated by a small piece of fusible metal, S, insulated from the plates by paper. The heat of the fire melts the metal and allows the springs to come together, and an electric current from the battery shown opens an automatic supply-cock. This device consists of an electro-magnet, M, which under the influence of the current attracts an arm, N, thus freeing the lever E. The weight, F, then



turns from right to left, and falls upon the lever H, whilst the part G removes a check which has kept the lever P in position. Under the action of the weight F, and by means of the lever P, which has its fulcrum in the point J, the supply-cock, C, is turned, and water rushes into the pipe A, to be discharged above. The cock at B, which is worked by hand, serves to stop the supply when the fire is extinguished. When it is desired to localise the discharge of water, a quantity of gun-cotton in a cap of the stop-cock can be exploded as in the other system, but by means of a red-hot platinum wire instead of a burning thread.

A Table-Bed.

A handy bed which serves the double purpose of a bed and table is about to be introduced into the French army. It is shown in

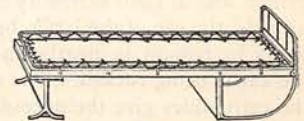


FIG. 1.

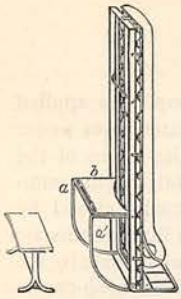


FIG. 2.

its two-fold capacity in Figs. 1 and 2, where all the parts will be recognised. It is the device of a Lieut. Bertillon. The stead or frame is iron, and the mattress is suspended from it by cordage. When in a horizontal position the foot rests on the form, which serves as a stool when the bed is used as a table. The runners, *a a'*, support the board of the table, *b*, which can serve for writing or for meals. The curvature given to the runners, *a a'*, renders it very easy to tilt the bed up into its vertical position, where it stands of itself or can be fastened to a hook in the wall.

can be made for the occupants either to face each other or to sit back to back. Not the least of the advantages of the car is that, while occupying only a little space, it is perfectly safe. One of the first of these cars was made for the children of H.R.H. the Duke of Edinburgh.

Electrical Shears.

Sir C. M. Lampson has invented a method of utilising electricity in the preparation of seal-skins. The skin is fed over a knife-edge bar, above which is stretched a fine platinum wire, which is raised to a white heat by the passage of an electric current, and meeting the longer hairs or bristles which rise above the under fur, mows them down. A similar idea has been proposed by a New Zealand sheep-farmer to shear sheep evenly and quickly, but the plan will be more difficult to realise in this case because of the living animal being so near the burning wire.

A Rocking-Car.

Children will welcome the appearance of the recently patented rocking-car, of which we give an engraving; and it bids fair to entirely supersede the familiar rocking-horse, as a means not only of affording amusement, but of healthy exercise for boys and



girls. As will be seen, its framework, which is very simple, consists of two curved rockers connected together, and at each extremity is a seat mounted upon an axle, the use of the latter being to allow the occupants to remain in nearly an upright position while the car is being rocked. The children on the seats at the extremities give the necessary impetus to produce the rocking motion; and the central car, or basket,



FIG. 1.

A New Garden-Seat and Table.

This new combination appears to be a very ingenious yet simple contrivance, by which a comfortable garden-seat (Fig. 2) may, in a moment or so, be converted into a serviceable seat and table (Fig. 3). The movable parts, which are made of iron and seem to combine strength with lightness, secure themselves automatically by their own weight, thereby dispensing with the necessity of bolts, pins, or screws.

Under the seat is a commodious locker-box, which

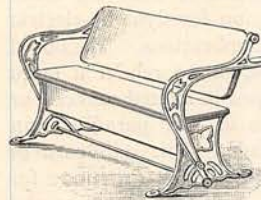


FIG. 2.

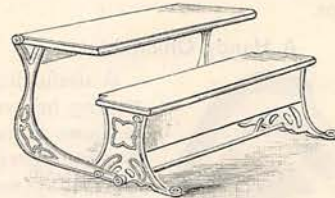


FIG. 3.

may be used for holding tennis-balls, quoits, garden tools, and such-like articles. An awning may be used with this useful piece of garden furniture (as shown in Fig. 1).

Floral Chandeliers.

The adaptability of the incandescent system of electric lighting to ornamental purposes is beautifully

illustrated by the splendid chandeliers fitted up with Edison lamps in the Entertainment Court and Concert Room of the Crystal Palace, and shown there during the Electrical Exhibition. The central chandelier in the Entertainment Court was quite a masterpiece of decorative art and metal workmanship, and represents an enormous bouquet of flowers, rising from a basket which is suspended from the roof. Some idea of its size may be gathered from the fact that it is 15 feet high by 10 feet wide at the base, and weighs about half a ton. The flowers, which are chiefly heaths, harebells, and tulips, spring from the basket on gilded stems, and bend over towards the spectator. The cup of each flower is of coloured glass, pearl-white, ruby-red, olive-green, or clouded blue, and sprays of sunflower, passion-flower, and tiger-lily are intertwined. From the centre of each flower projects an incandescent lamp, like an enlarged pistil. There are nearly a hundred of these lamps in the tapering cluster, and the effect is truly gorgeous. A smaller chandelier, more suitable for an ordinary drawing-room, is also exhibited. This is composed of golden chains and festoons of crystal drops, set round with a ring of fourteen clear lamps, and containing a lamp of ruby glass in the centre.

Edison's lamp, it will be remembered, consists of a thin loop of carbon heated white by means of the electric current, and enclosed in a glass bulb shaped like a jargonelle pear and exhausted of its air. The bulb can be blown of any kind of glass, red, green, yellow, blue, or clouded, and thus the colour of the light can be easily changed, either for æsthetic purposes to harmonise with a room, or to suit the chemical process of a photographer, or the weak eyes of an invalid.

Moreover, since it requires no air and gives off very little heat, besides being sealed up and prevented from causing fire, the new light can be burned under water to illuminate aquaria, or hung in globes of coloured water.

A Phosphorescent Coral.

A beautiful specimen of phosphorescent coral has been secured by Mr. C. F. Holder, of New York, and placed in his aquarium. As described, it consists of five branches, each ending in a luminous cell, which glowed at intervals with a greenish light sufficient to illumine the water for a distance of several inches. The light was intermittent like that of a firefly, and its cause is quite unknown.

While upon the subject of phosphorescence we may mention that Captain Abney, R.E., has found that the substance known as Balmain's luminous paint does not give out any phosphorescence if excited by red light. It is the blue rays of the spectrum which chiefly excite it, and if the spectrum be projected upon a luminous screen of Balmain's paint in a dark room, the blue rays will enhance the luminosity and the red rays will quench it, so that the red end of the spectrum is seen as a series of black bands on the glowing paint. Moreover, Captain Ab-

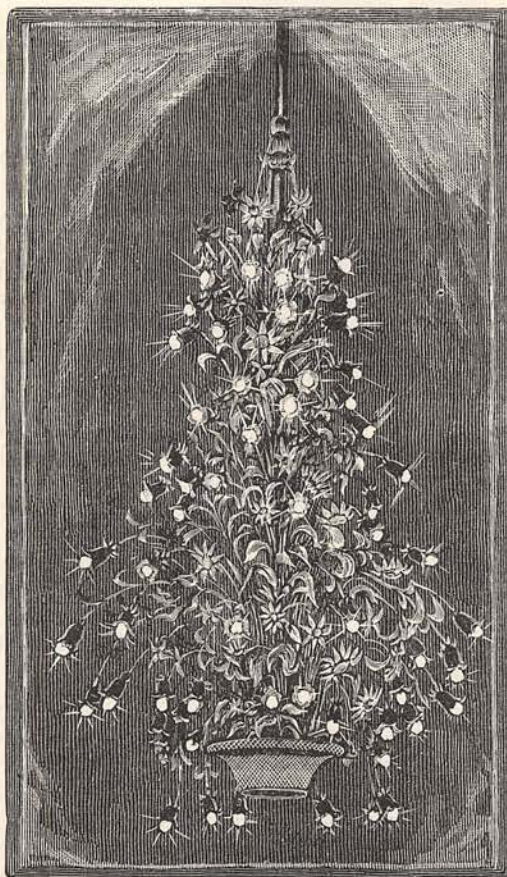
ney has found that there are certain regions of the blue end of the spectrum, or, which is the same thing, certain blue rays in sunlight, that do not produce this phosphorescence in the sulphide of calcium which is the active basis of Balmain's luminous paint.

Driving Piles by Electricity.

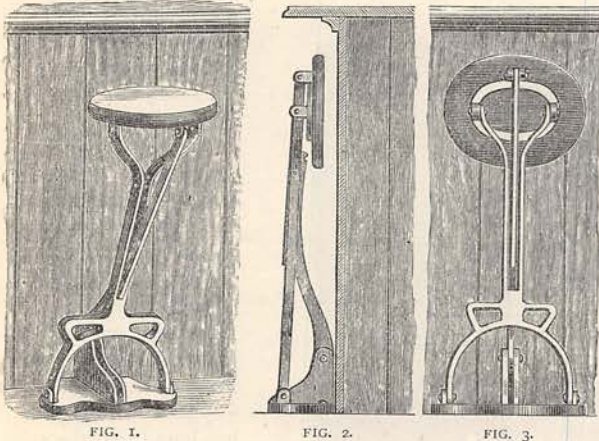
One of the latest applications of electricity to motive-power in this country is the driving of piles. At Hatfield House, the seat of the Marquis of Salisbury, a number of piles to form a dam across the river Lea were driven by a dolly lifted by the power of an electric current. The current was supplied by a dynamo-electric machine put in motion by a water-wheel at some distance from the scene of operations.

A Seat for Shop Assistants.

Seemingly to remove the objection against the introduction of seats in shops put forward by some



employers, that their room when not in use cannot be spared from the narrow space behind their counters, a capital seat was exhibited at the late Building Exhibition at the Agricultural Hall, Islington. Fig. 1



gives a view of the seat when in use. When not in use the seat may be made to rise up almost flush with the counter, as shown in Fig. 2, thus taking up very little space indeed. Fig. 3 gives a back view of the seat when closed. Although designed for shops, it is obvious that it may be used anywhere where space is an important object.

Fireproof Ink and Paper.

A German chemist gives the following receipt for a fireproof printers' ink:—Take 10 parts by weight of dry platinum chloride, 25 parts of oil of lavender, and 30 parts of varnish, and mix them with a small quantity of lamp-black. The action of fire on this compound is to reduce the platinum salt to the metallic state, and leave a brownish-black stain. A fluent ink for writing with an ordinary pen can, according to the same authority, be made from 5 parts of platinum chloride mixed with 15 parts of lavender oil, 15 parts of Chinese ink, and 1 part of gum arabic; the whole dissolved in 64 parts of water. When this ink is written with on fireproof paper the burning of the paper renders the writing transparent, so that even though the ink has faded the writing can be rendered legible by heating the paper. Such paper is prepared by mixing 95 parts of asbestos with five parts of woody fibre, and beating into a pulp with borax and glue-water. Pigments for painting can also be rendered fireproof by mixing with the ordinary metallic colours the chloride of platinum and painters' varnish, together with some aquarelle pigment to strengthen the "covering power" of the colour. We doubt, however, if these pigments would retain their original purity of tint after passing "through the fire."

Paper Felt.

A cure for gaping crevices between the boards of flooring that has shrunk on drying is to be found in

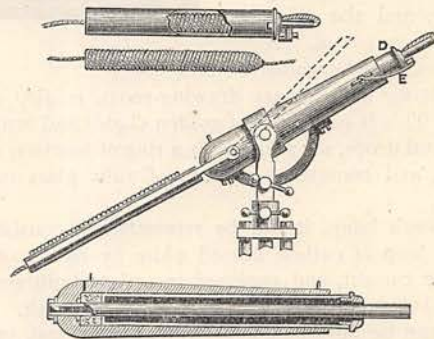
the material somewhat oddly called "paper felt." The dust and draughts which attend these open floors are troublesome and injurious to health, and layers of brown paper placed beneath the carpet have been resorted to as a remedy, but a layer of the woolly felt in question is far more wholesome and comfortable. It adds to the warmth and dryness of a room, and being heavy lies quite flat under the carpet, to which it gives a soft pleasant feel under the feet.

Asbestos Filters.

Asbestos felt, or fine tissue, is now employed in the laboratory as a filter for chemicals. Its peculiar merit consists in the fact that it resists the corrosive action of strong acids as well as the heat of fire and flame. For this reason gloves of asbestos are useful in handling acids, to protect the skin. Similarly a sheet of asbestos paper protects a table from acid stains. Asbestos also makes excellent porous cells for galvanic batteries, and when kneaded with plastic clay is a good luting for the stoppers of bottles containing chemicals. At a recent meeting of the *Société d'Encouragement* of Paris, M. de Luynes drew attention to the air-filter of M. Eppé, which consists of a bed or layer of cotton-wool, or asbestos, six inches thick. The air is blown through it by a fan, and is deprived by the meshes of the filter of dust particles, and germs of disease or fermentation.

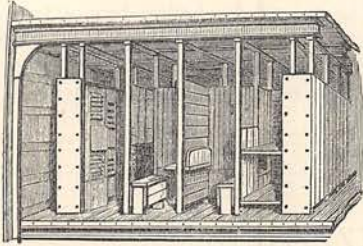
A New Life-Line Gun.

This new arm is illustrated in the accompanying woodcut, and consists of a small cannon mounted on a swivel carriage, and containing inside a tube, E, which holds the line. This tube runs through the



bore and butt-end of the gun, so as to enable the line to connect with the spare line to be paid out. The projectile, D, is a steel cylinder longer than the bore of the gun, but not so long as the central tube just described. The forward end of this projectile or cylindrical case is closed with a "cop" fastened by a bayonet joint, and it contains a cop carrying about 250 yards of line. A hole is made in the axis of this cop large enough to allow the central tube to pass through it,

and when the gun is loaded with an annular cartridge the cord is led down the central tube and out through the breech of the gun. On the front of the projectile case is a small bracket for carrying a signal rocket, and when the projectile leaves the gun, the pull on the cord attached to the bracket and the outside of the gun, as shown, ignites the composition and fires the signal.



Movable Berths.

At the recent Naval and Submarine Exhibition, Islington, some movable berths for emigrant ships were shown. The engraving represents a series of four berths running parallel with the ship's side, and giving room for a passage. The right side of the figure shows the berths ready for use at night, and the left side shows them folded up by day, leaving the greater part of the deck clear. In each berth there is a table which folds down at night, and opposite a locker. The s.s. *Dalhousie* has recently been fitted up with them for service to Australia.

A Water-bearing Tortoise.

Most of us have heard of the giant cactus of the Mexican deserts, which contains a great quantity of drinkable water in its soft fleshy lobes, and sometimes relieves the thirst of travellers in those arid regions. Another water-bearer has recently been found to exist in the desert tortoise, a fine specimen of which has been presented to the Academy of Science at San Francisco. It was brought from the Cajon Pass in San Bernardino County, California. The water is contained in a bag under the carapace, and a pint of it can be taken from a full-sized specimen. It is believed that the creature gets the water from the above-mentioned cactus, on which it feeds. The cactus and tortoise are almost the only life of these wastes, and Nature has doubtless found it necessary to endow them with this water-bearing power.

An Electrical Boiler.

It is well known that when a current of electricity is sent through a metal wire which offers considerable "resistance" to its passage, the wire becomes heated; and this property has been applied by Mr. St. George Lane Fox in making a little electric egg or coffee boiler. As exhibited at the Crystal Palace, this utensil consists of a sheet-metal vessel with double walls, between which is wound a coil of German silver or iron wire as the case may be. This wire is bare of

insulating material in order to allow its heat to radiate freely, and the coil encircles the inner hold or well of the vessel, which is capable of containing a pint or more of water. The ends of the wire are connected to two terminals on the exterior of the boiler, and when a sufficiently strong current is passed through it the water in the hold begins to boil. With the boiler exhibited connected up to the wires leading to one of Mr. Lane Fox's incandescent electric lamps, it is possible to boil a pint of water in ten minutes. When electricity is supplied to every home the contrivance will be useful.

A Storm-Lamp.

A lamp for use at sea in the strongest gales and showers of rain was recently exhibited at the Naval and Submarine Exhibition in the Agricultural Hall. As illustrated in Figs. 1 and 2, these lamps consist of an oil reservoir and burner, which is surrounded by a dioptric lens like a light-house flame. The burner is enclosed in a vapour-tight chamber, and surmounted by a copper chimney, so that it is quite wind and water-tight. The vapour-tight chamber of Mr. Blake allows the mineral oil used to be heated to a high degree without any danger, and thus a more brilliant light is produced. Moreover there is no

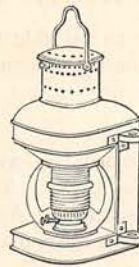


FIG. 1.

waste or smell from the escape of unconsumed vapour. Several railway companies have, after long trials, adopted these lamps for semaphores, platform lamps, and other signals, as they can be used with perfect safety where other lamps would catch fire.



FIG. 2.

A New Food-Preserver.

Professor Barff has discovered a new antiseptic for preserving flesh and other fresh foods liable to decay. It is well known that boric acid is an excellent preserver, but it has the drawback of not being easily soluble in water, and hence is difficult to apply in a liquid state to the purpose in question. Professor Barff has, however, found a promising solvent in glycerine, and the mixture of these two substances, or "boro-glyceride" as it is called, is the antiseptic discovered. A quart of cream treated with an ounce of boro-glyceride keeps quite good even in the hottest weather, and a quantity of it has been sent to Zanzibar through the furnace of the Red Sea without impairing its sweet qualities. Fresh fruit, guavas, tamarinds, green sugar-cane, as well as raw turtle and pigeon, were sent from Jamaica preserved in the fluid, and proved to be good and wholesome, retaining still their characteristic flavours. Professor Barff proposes to save railway carriage on milk by condensing it in the country and mixing it with boro-glyceride, so that it has only to be mixed with water when required for use. The meat now wasted on the South American

plains could also be preserved for transport to the coast and the European markets. Beef-tea, raw beef juice, which is recommended by medical men for some conditions of the digestive system, soups, and other delicacies can be preserved for any length of time by the new substance. When introduced into liquids capable of fermentation it prevents the process, unless the latter has already begun, when it only exercises a moderating influence. Professor Barff is also the inventor of the plan for coating iron with a rustless skin of oxide of iron, and we may add here that frying-pans, saucepans, and other vessels usually made of copper, are now made of iron treated by the Bower-

Barff process of preventing rust, and found very convenient. In working this process it has been found that the cost of enamelling the iron with the magnetic oxide forming the rustless coating is much reduced by first oxidising the articles before enamelling them. Further, it has been discovered that a skin or bloom of all the more ornamental metals can be given to the grey surface of the rustless coating, by simply brushing it over with a wire brush of the metal required to be deposited, whether bronze, brass, copper, silver, nickel, or gold. The particles of the brush rubbed off by friction fill up the pores of the coating, and by slightly heating the article they are fixed there.

NEW PRIZE COMPETITIONS.



THE Editor is happy to be able to state that the Proprietors of the MAGAZINE have decided to continue the scheme of Prize Competitions, and he accordingly has the pleasure to announce to his readers the nature and conditions of the following Prizes:—

1. A PRIZE of £5 will be awarded for the best PRACTICAL PAPER on *Domestic Training for Girls*. The length of the Paper should not exceed four pages of the MAGAZINE. All MSS. must be properly authenticated, and sent to the Editor not later than September 1st, 1882.
2. A PRIZE of £5 will be awarded for the best POEM on *Happiness*, or any subject directly bearing thereon. To be in rhymed verse, of any metre the candidate may select, and the length not to exceed fifty lines. All Poems must be properly authenticated, and sent to the Editor not later than December 1st, 1882.
3. A PRIZE of £5 will be awarded for the best MUSICAL SETTING of the following words:—

Child, amidst the flowers at play,
While the red light fades away;
Mother, with thine earnest eye,
Ever following silently;
Father, by the breeze of eve,
Call'd thy harvest-work to leave—
Pray! ere yet the dark hours be,
Lift the heart, and bend the knee!

Traveller, in the stranger's land,
Far from thine own household band;
Mourner, haunted by the tone
Of a voice from this world gone;
Captive, in whose narrow cell
Sunshine hath not leave to dwell;
Sailor, on the dark'ning sea—
Lift the heart, and bend the knee!

Warrior, that from battle won,
Breathest now at set of sun;
Woman, o'er the lowly slain,
Weeping on his burial plain;
Ye that triumph, ye that sigh,
Kindred by one holy tie,
Heaven's first star alike ye see—
Lift the heart, and bend the knee!

MRS. HERMANS.

The Song may be arranged for any voice, with suitable *Pianoforte Accompaniment*. Competitors must send in their MSS., properly authenticated, to the Editor not later than February 1st, 1883.

GENERAL RULES.

1. Every reader of the MAGAZINE is eligible to compete for all or any of the Prizes offered.
2. The Editor cannot undertake to answer inquiries having reference to the treatment in detail of the above subjects. *The descriptions given under each head are sufficient for the purposes of the Competition, and the rest is left to the judgment and discretion of the competitors.*
3. Each MS. must have inscribed on it, or otherwise securely attached to it, the name and postal address of the author, together with a declaration that *the work is original, and entirely the sender's own*, to be signed by the author, and countersigned by some other trustworthy person, *i.e.*, a magistrate, minister of religion, or householder, with the postal address in both cases.
4. In all cases, the copyright of the successful works will become the property of Messrs. Cassell, Petter, Galpin & Co., the Publishers of this Magazine.
5. In cases where the two best works in any one Competition are of equal merit, the Prize may be divided at the discretion of the Editor.
6. The Editor will not be responsible for loss or miscarriage of any work during transmission, and all letters or packets must be *pre-paid*. The Editor cannot undertake to return unsuccessful MSS.—copies should therefore be retained by the senders.
7. Every MS. must be sent before the date named above as the latest day in each section, addressed—

THE EDITOR OF CASSELL'S MAGAZINE,
LA BELLE SAUVAGE YARD, LONDON, E.C.