

The Senorita jacket, under a new name, is again introduced. It is sleeveless, with high epaulettes, is cut up in the centre of the back, but fits the throat closely, and is generally so betrimmed with beads that no foundation is necessary; it is a most comfortable addition to either a high or low bodice, making the one more dressy, the other less so. Colarettes of embroidered lace and velvet, coming well to the shoulder, answer the same purpose.

In Paris, Japanese embroideries on silk find great favour, and most of the designs have some inspiration from that country.

Interplaited galons of gold braid and chenille are a good deal worn, and bead fringes and bead insertions. Woven beaded cloth, which will not unravel when cut, is applied to bodices, and there is much braiding used which can be bought ready for use. It is more of the nature of lace, being made of half-inch-wide silk, or worsted braid, united by French wheels.

The buttons worn on cloaks and on jackets are

very large; otherwise small bullet buttons are most used, of coloured metal, imitation onyx, or coloured ivories.

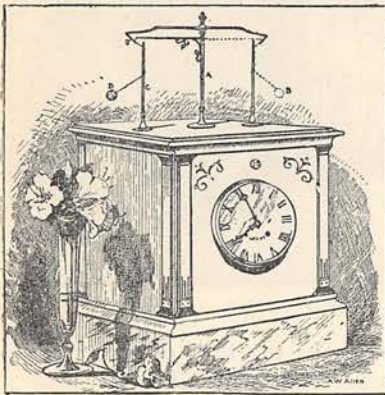
In-door and out-door costumes are shown in our illustrations. In the former there is a good example of the manner of utilising piece lace alluded to above, and which is universally worn. The collar is cream, the dress is pale green of the reséda tint, and rich dark red velvet forms the bordering and trimmings.

The elder lady, who is carrying her dog along the parade of a fashionable watering-place, wears a plain and broché canvas dress of the popular combination—the Guards' colours, blue and red. The paniers—a mode again coming in—are bordered with blue velvet. The canvas bonnet has ostrich tips and an osprey aigrette, and the brim is bordered with beads. The younger lady is in crevette pink zephyr, with frisé claret dots. The demi-corsetlet is velvet, so is the band round the throat. The coarse straw hat to match has rosettes of woollen or Yak lace in front.

## THE GATHERER.\*

### A Twisting Clock.

A curious new American clock, to be seen in some of the London shop windows, is illustrated in our engraving. Its chief peculiarity is the form of the pendulum, which consists of a small bead or ball, B, suspended by a thread from a bracket, P. The rest of the works are like those of an ordinary clock. The



train of wheels actuated by the main spring, which is wound up daily, causes a vertical axis to rotate. This axis, O, is the metal standard, A, rising upright from the case, and carrying the bracket, P, from which the ball is hung. As the axis rotates the bracket turns round with it, and would describe a complete circle were it not that the thread of the pendulum catches on the end of the cross-arm or stopper, T, and then swings the ball round and round the upright, C. It quickly unwinds, however, but catches again, and after winding and unwinding itself a second time, it swings

clear of the obstructions, and allows the bracket P to move on to the other side, where the thread again encounters a similar catch, which temporarily stops it. In this way, with a brief stoppage every 180 degrees, the axis continues to revolve. Thus in each revolution of the axis the thread makes eight coils round the uprights, four at each. The clock is regulated with great precision by simply adjusting the length of the thread by means of a runner in the bracket. The time of a revolution of the axis, including eight successive windings, is six seconds.

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### Improved Steel Gardening Tools.

New weed forks and rakes, made of steel, hardened and tempered, have recently been introduced by a Sheffield firm. These "Princess" tools, as they are called, are so formed as to give the greatest possible strength with the least possible weight. Gardeners who have experienced the annoyance which the breakage of a weakly-constructed tool causes, will know how to value these durable, though light, steel-toothed forks and rakes.

### A Steam-Dogcart.

A steam-vehicle has recently been constructed in France, and tried in one of the streets of Paris. It consists of a dogcart body, mounted on two wheels, and drawn by a small portable steam-engine with vertical boiler. The engine, in fact, takes the place of the horse, and the body of the carriage forms part with the engine in front, the steps for getting out and in being placed between the two parts. The whole runs on four wheels, and carries two persons with their luggage. The engine has some new features suitable for the nature of the work, which, however, are of a highly

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technical character. Coal and water sufficient for the journey are taken on board, and the vehicle can travel on a good road at the rate of twenty-four miles an hour.

#### Platinising Glass.

A method of coating glass with films of platinum as brilliant as silver has been devised by Professor Böttger. Perfectly dry chloride of platinum is mixed into a paste with oil of rosemary, then mixed with five times its weight of oil of lavender into a thin fluid. It is then left to stand for half an hour, and afterwards spread in a thin layer over the glass, and the plate or vessel thus coated is next subjected for a few minutes to the red heat of a muffle furnace or the flame of a Bunsen blow-pipe, used with care. This firing produces a bright lustre of platinum on the surface of the articles. If the result is faulty from some cause or other, the film can be removed by pouring hydrochloric acid over the articles and touching them with a zinc rod. On filtering the liquid thus produced, the platinum is recovered from the acid. Dr. Böttger thinks that the oil of lavender forms an organic platinum salt, which, on being heated in the way described, leaves a deposit of metallic platinum.

#### A Carbon Dust-Pail.

A carbon dust-pail for use in households has been brought out by Dr. R. Nicholls. Its novel feature is the use of soot, or carbon in fine sub-division, as a deodoriser. It is made of galvanised or painted iron, and has a lid fitted with a carbon box, with a perforated bottom. This lid-box (for the lid is virtually a smaller box) is occasionally filled with fresh soot or powdered carbon. In addition to this, there may be a sliding tray of soot in the box to further absorb the gases given off. When the lid is closed firmly a shower of soot falls from it as from a pepper-box, so that every time the box is opened to admit dust or refuse, a sprinkling of soot is thrown in. Such pails and bins may be kept in-doors with impunity.

#### Aluminium Alloys.

Pure aluminium, as prepared under the process invented by Mr. Webster, is very favourable for alloying with other metals—for example, nickel—and hence the "Crown" metal, which resembles silver in appearance, and possesses a greater tensile strength than steel. It is now made into a great variety of articles, from scarfpins to ships' anchors, from cigarette-cases to screw propellers. All kinds of culinary articles, tea services, forks and knives, door-plates, and house-furnishings are now made from it, including chandeliers, drawer-handles, dinner-gongs, &c.; and out-of-door implements, such as bits and spurs, bicycles, surveyors' chains, are also constructed from the alloy, which, when polished, preserves its bright appearance, and does not oxidise. This immunity from oxidation, especially in the case of furniture and cutlery, is a decided advantage. None of the ordinary food acids affect the new alloy, which is more than can be said for steel.



A Signal-Buoy.

The "Whitby" life-buoy is well equipped for saving life. As illustrated herewith, it consists of a copper buoy divided into eight watertight compartments, and fitted with a chain on which to rest the feet in the manner shown. Two flags, a whistle for sound-signals, and two hand-lights for use in the dark, as well as a flask for spirits, are also provided. Moreover, there are two calcium lights attached, which burn, on contact with the water, for over an hour. The buoy is now supplied to the navy.

#### A New Oar.

The oars in common use are frequently rendered useless by the wooden blade being damaged from a blow or other accidental cause. Even when the edge of the blade is bound with iron, considerable inconvenience is caused by the warping of the wood or from damage to the sides of the blade. An American firm has recently introduced an improved oar, in which the blade is made of sheet metal, and is attached to the stock by means of a tapered metal socket, firmly secured by rivets. The new blade can, of course, be made in all the shapes given to the old wooden one; it springs easily, and is said to do away with splashing on entering and leaving the water.

#### Roraima.

The mountain, or table-land, of Roraima, in the forests of Demarara, has at length been scaled by Mr. Im Thurn, but a full account of his researches has not yet been published. The Roraima is of curious scientific interest, as the flat top was supposed to have been isolated from the rest of the world below for an enormous lapse of time, and it was expected that the explorer would find there many unknown species of plants and animals. It was, in fact, regarded as a secret drawer in nature, and, from the

few lines which have reached us from Mr. Im Thurn, this hope will not entirely be disappointed, as he describes the scenery to be "in the highest degree wonderful," the vegetation being "most wonderful, but somewhat scanty and quite dwarf. I have between three hundred and four hundred species for you." The absence of trees and the elevation of the top made it feel "bitterly cold"; but the plateau does not appear to be so isolated as it was formerly believed. We may add that the lower slopes and environs of the mountain are of remarkable luxuriance and beauty, the "orchid gardens" being very fine.

#### Cork Bricks.

In Germany they are now trying a composition of cork, sand, and lime, moulded into bricks, for the construction of light partition walls. It is said to exclude sound better than ordinary brickwork, while being light and a good non-conductor of heat.



FIG. 1.

#### A New Garden Engine and Roller.

A new garden engine has recently been invented, which combines in its action the advantages of the ordinary garden engine and of the watering-can. The engine is mounted upon two rollers, and attached to the tank is a pump for forcing the water into the jet as in the ordinary garden engines. But the powerful stream of water sent through a jet is apt to splash the mould on to carefully-arranged plants in carpet-beds, or to wash away the soil from the roots. This difficulty is overcome by an ingenious syphon arrangement. A glance at our illustrations will show the working of the engine. Fig. 1 shows the engine as arranged for watering shrubs and hardy plants which are able to bear the force of a strong jet of water. The tap, C, is closed, and the pump being worked, the water is forced through the

pipe, A, to the jet, B, by which it is diffused. For the watering of carpet-bedding or delicate plants, the jet, B, is removed, as in Fig. 2, and a hose attached to the nozzle. The tap, C, is then opened, and the water flows gently through it to the hose, and will continue to do so until the tank is empty. A suitable sprinkler, D, is provided at the free end of the hose. The rollers upon which the engine is mounted enable it to be moved across lawns, along paths, and round corners, where wheels would cause serious damage; and the machine can also be used, if required, as a garden roller. We may mention, while upon this topic, that improved garden-hose reels are now made, mounted upon rollers in the same way as this new garden engine.

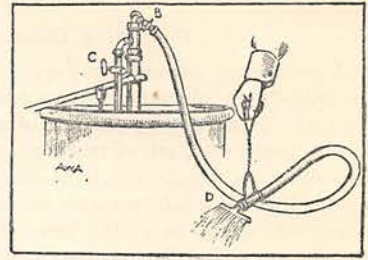


FIG. 2.

#### Illuminating Balances.

In measurements with balances of great precision it is sometimes necessary to use reflected light, because if oil-lamps were brought near the balance its readings would be disturbed by the heat. The electric incandescent light, however, has recently been applied to this purpose with success at the office of a London paper. A small incandescent lamp, enclosed in a glass vessel of cold water, which is kept circulating, serves as the lamp, which can be brought near the balance without ill effect on the readings. The cold water draws off the heat of the lamp. A small voltaic battery supplies the current. During a recent comparison of two kilogram weights at the newspaper office, by the help of this lamp, it was found that no practical interference resulted from its use, the probable error being only 0.005 milligram, more or less.

#### Utilising Niagara.

The proposition to use the water-power of Niagara for generating electricity to supply electric light and power to the neighbouring district, has to a small extent been realised by a dynamo in a mill at Niagara Falls. The dynamo supplies the electricity for telephonic purposes to some three hundred towns and villages, one of these being Buffalo, twenty-five miles away. Nearer home an attempt to light the town of Greenock from the water-supply derived from the high hills behind it has also been begun. A portion of the town is lighted by Swan incandescent lamps, fed by a Victoria dynamo, driven by a Günther turbine at the water-works. If the experiment succeeds in point of cost during six months, it will probably be extended to other parts of the town.

Greenock has a number of sugar refineries, which could also employ electric power if it were advantageous to do so.

#### Hardening Plaster.

A useful method of hardening plaster so as to make it resemble stone, and suitable for flooring, has been invented in France. Plaster and soft rich lime, recently slaked and finely sifted, are mixed together (six parts by weight of plaster and one part of lime) so as to make a good plaster, which is moulded into plaques or other objects, which are dried, then steeped for two hours in a saturated solution of sulphate of zinc or sulphate of iron. A hard chemical compound is thus formed with the plaster, which takes a good polish, and is white in the case of zinc, and brown in the case of iron. The first immersion should not be longer than two hours, otherwise the surface is apt to become friable.

#### The Camera Obscura in Coast Defence.

In a harbour protected by torpedoes the camera obscura might be used to guide the firing party, in the manner shown in our engraving. The table is a sheet of glass or screen, on which the camera throws an image of the port or harbour by means of the optical arrangements shown. Black points marked on this image indicate the positions of the torpedoes. The enemy's ships—or, rather, the images of them—are seen outside these torpedo lines. Now, when a ship approaches close to a torpedo, its image will be seen nearing the corresponding black spot, and when it is sufficiently close the officer on the look-out presses a corresponding key, sends an electric current, and explodes that torpedo. To render this plan successful, the firing station should be in a position whence a good view of the harbour is obtained.

#### A Simple Lantern Screen.

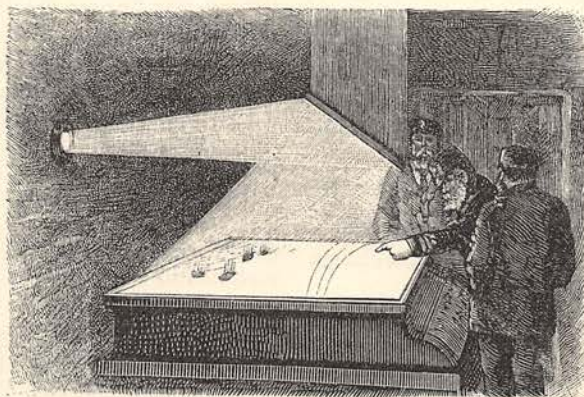
The optical or magic lantern is now so much used for educational purposes, that it may be useful to know of a simple and inexpensive screen. This is formed of a sheet of French tracing-paper, of a kind possessing a remarkably dull non-reflecting surface. By means of it and an oil-lamp lantern it is easy to show pictures well to 200 people in a room fairly well lighted, provided that extraneous lights are not placed behind the screen.

#### Electricity from Sugar.

Signor Salvatore Mazza, an Italian electrician, recently obtained sparks of electricity about one inch long while braying sugar in a copper mortar with a wooden pestle. The sparks were sometimes blue and sometimes reddish-yellow. Their development was probably due to friction, and Signor Mazza has seen his experiment repeated successfully with an iron pestle and a copper mortar.

#### Earthquake Signals.

It has been proposed to utilise the telegraph system of Japan to give automatic warning of earthquakes to the various towns and villages of that country, thus enabling the inhabitants to evacuate their houses, and prepare for the coming shock. This could be done by arranging the seismograph, or earthquake detector, to complete an electric circuit, which would send the necessary telegraphic alarm to ring a bell or fire a gun. Earthquakes are almost of daily occurrence in Japan, so the suggestion is worthy of attention.



THE CAMERA OBSCURA IN COAST DEFENCE.

#### Carbon in Steel.

Experiments made for some time past in the Creusôt works, France, on thin plates of steel ( $\frac{2}{100}$  to  $\frac{3}{100}$  millimètres thick) examined under the microscope after treatment by the dissolving action of acids, show that cast steel is formed of granules of soft iron separated from each other by an envelope of carbide of iron, an alloy of iron and carbon. These simple cells are agglomerated into clusters, or compound cells, separated by layers of soft iron, and usually of polygonal shape. Hammer-hardening deforms these cells, but otherwise is unlike tempering, which causes the compound cells to disappear, leaving the single cells as the constituent element.

#### An Electrical Graver.

A new engraving machine, operated by electricity, has been introduced lately by Lieut. B. Carter for decorative engraving on metal-work. The designs to be engraved are first set up in type or stereotype, and an arm of the machine passes over it. The arm has a platinum point under it, which travels over the surface of the type in parallel lines, and in so doing, starts or stops the current in an electro-magnet, which, by its attraction on a soft iron armature, brings the graving tool into action on the plate to be engraved, and the working goes on so quickly that hand-engraving is far outstripped.

### An Alum Mountain.

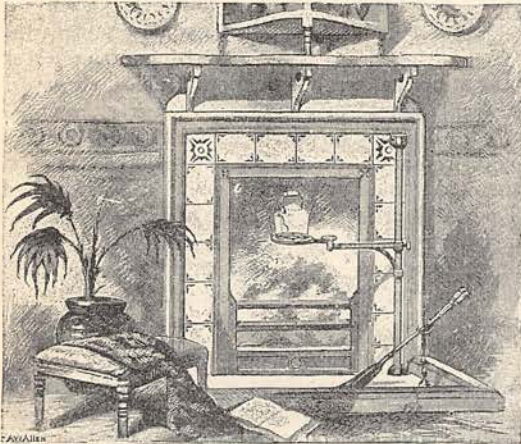
Recent explorations in Socorro County, on the Gila River, in the United States, have brought to light immense deposits of natural alum. At one part these beds rise into a mountainous form, on a base about one mile square, with cliffs of alum rising 700 feet above the river. The alum is very impure for the most part, and tastes of sulphuric acid, but there are said to be cliffs of very pure alum, which could be worked for commercial purposes. The country is well wooded and watered, and there are numerous hot springs of medicinal virtue in the neighbourhood of the alum cliffs.

### Rearing Puppies in Coloured Light.

Dr. Ernst Herbacewicz is reported to have reared young puppies in lights of different colours, in order to see if they produced any effect on the characters of the animals. According to his results, as published, puppies reared in green light were of extreme cheerfulness and playfulness; those reared in orange light were also playful, but their movements were heavy and awkward, their tempers cross and quarrelsome. Blue and violet rays appeared to have a soothing and taming influence, while red light seemed still more to destroy liveliness. The experiments reported are of an interesting nature, but require scientific confirmation. It has long been known that light affects the development of living things, especially plants, which are confined to one locality and cannot seek a change of scene.

### An Improved Trivet.

An ingenious device for holding a kettle or saucepan over an open fire is shown in our illustration. A vertical rod is fixed in socket bearings to the side



of the grate, and on this rod slides a bracket with two folding arms. This bracket may be clamped by one arm to its supporting rod at any height, and bears on the free end of the other arm a stand on which to place a cooking vessel. The advantages of this new trivet are that a kettle or saucepan may with perfect safety be used at any time, whatever be the height or condition of the fire, and that it is

not necessary to break up the fire to secure a standing-place for the vessel. Where a kettle is frequently required, as in a breakfast-room or nursery, such a trivet as this should be very useful.

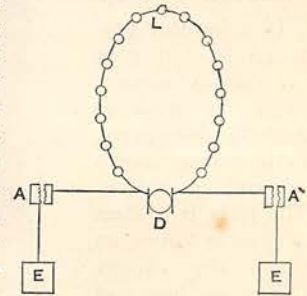
### The Sonebula.

The Board of Trade requires that when a steamer is under way in a fog, sound-signals shall be made at intervals of not more than two minutes. This is a tedious operation, sometimes forgotten or neglected; and a mechanical fog-horn, or whistle operator, termed a "Sonebula," has been introduced. It turns the steam on and off at the proper times, thus replacing a man or boy. The arrangement is essentially a small auxiliary engine, worked by steam, consisting of three cylinders, two of which are controlled by one valve, and the third acting as a "cataract," controlling the length of interval the fog-whistle is to blow and remain silent. The details are purely of mechanical interest, and we need not dwell upon them.

### Protecting Electric Lights from Lightning.

In the accompanying figure, if D is a dynamo supplying a series of arc lamps, L, in circuit with it, a flash of lightning striking the circuit at L might pass along the lamps through the dynamo and destroy the latter, unless it were protected by two lightning arresters at A A'.

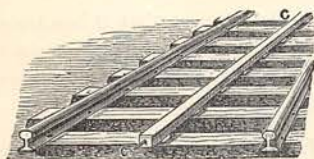
But the ordinary lightning arrester employed on telegraph lines to protect the instruments would hardly serve, because the discharge of lightning going on at the two arresters would partially short-circuit the dynamo to earth by the earth-plates, E, when the sparks were fairly passing between the two corrugated plates of the arresters. Professor Elihu Thompson has therefore devised an arrester to overcome this drawback. It consists of two segmental plates placed between the poles of electro-magnets. When an arc is formed by the lightning discharge between these two plates, and the reduction of air resistance thereby caused misleads the current of the dynamo by the same route to earth, the electro-magnets repel the arc to the upper part of the segmental plates, where they are further apart, and where it breaks, because the electromotive force is insufficient to bridge over the gap. The arrester, therefore, guards the dynamo from short-circuiting for any length of time.



### A Travelling Telegraph.

An ingenious means of keeping up telegraphic communication with moving trains throughout the whole length of a railway has been devised by a well-known American inventor, and introduced on the New York and New Haven Railroad. It consists in running a telegraph conductor, C C (see the

figure), in a closed trough between the rails of the line, and attaching a long parallel coil of wire to the bottom of the telegraph office car forming part of the train. This parallel coil is fixed so as to move close

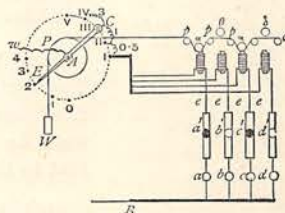


over the conductor as the train travels along, and the telegraphic signal currents sent into the conductor from the distant stations sending the message induce corresponding, but much feebler, currents in the parallel coil hung from the bottom of the car. This is in circuit with a delicate relay in the car, which brings into play a local battery on board the car. The currents of the local battery are strong enough to actuate an ordinary telegraph instrument such as the "Sounder," and so the message is delivered to the attendant clerk. By a reversal of the process, the clerk can also telegraph back to the station from the moving train. A telephone is also included in the apparatus for receiving the message. In this way, a person travelling by rail can keep up telegraphic communication with the stationary world, and also receive the latest news and prices of stocks. The invention points to a time when every train going an important journey will have its telegraph car and news reports.

#### The Automatic Phidol.

"Phidol" is the name given to an electric light regulator, invented by M. Lacoine. It is intended to insert properly adjusted resistance in the lighting circuit in place of the resistance of lamps not in use, so as to keep the total resistance of the circuit always the same, whatever the number of lamps burning. The automatic phidol is shown in our figure, where E A C is a revolving arm to which the current is brought by the wire, *w*, and from which it passes into the circuits of the lamps by the end of the arm, C, which traverses a series of contact-points, between which are inserted resistances of wire, I, II, III, IV, &c., of graduated values—say, 0.5, 1, and 3 ohms, &c., according to the necessities of the case. The other end of the lever, E, serves as an index, and points out the number of lamps burning at the time—0, 1, 2, 3, &c., as the case may be. The lamp circuits branch from the point I, and run "in parallel" to the return wire, B, of the circuit, which goes back to the generator. The lamps in the figure are marked *a*, *b*, *c*, *d*, and the switches, or keys, which turn on or off the light are shown at *a*<sup>1</sup>, *b*<sup>1</sup>, *c*<sup>1</sup>, *d*<sup>1</sup>. When a

plug is in (as shown by a black dot), the current is on and the lamp lighted; when a plug is out, the lamp is also out. This, of course, is done by the householder using the light as he requires it. Electro-magnets of low resistance, *e*, *e*, *e*, *e*, are interposed in these lamp circuits, and when the current is flowing in a circuit, its electro-magnet attracts an armature, *a*. A weight, *w*, is attached to the end of a silk thread, whose other end is fixed at *o*. This thread passes over the pulley P, which moves the arm E A C, and it also supports the armatures of the electro-magnets, *a*, *β*, *α*, *δ*, from smaller pulleys, *p p p*, as shown. Now, it will be understood that the lamps which are lighted pull down the armatures, and thus move round the arm, thereby altering the resistance (I, II, III, &c.) in the circuit, and at the same time indicating the



number of lamps lighted (0, 1, 2, 3, &c.). The more lamps are lighted the higher will the weight *w* be lifted, and the less the resistance inserted in circuit by the moving arm E A C, until, when all the lamps are lighted, there is no compensating resistance inserted by the arm.

#### 1884 FABLE COMPETITION.

*The Editor has pleasure in publishing the award in this Competition, which has been unavoidably postponed since the beginning of the year. The Prize of TWO GUINEAS, offered for the best set of Six Original Fables, is awarded to*

The Rev. T. ROACH, M.A., Cambridge House,  
All Saints Road, Clifton, Bristol.

*And Honourable Mention is awarded to the following, in order of merit:—*

ANNIE MASTIN WATSON, Mulgrave Lodge, near  
Whitby, Yorks.

OSCAR HARRISON, 104, Gladstone Road, Edge-  
hill, Liverpool.

MARIANNE WALKER, 37, Carpenter Road, Edg-  
baston, Birmingham.

*The Editor hopes to publish the Prize Fables in a future number of the Magazine.*

## "BRIGHT DAYS."

THE EDITOR has the pleasure to inform his readers that on the 25th of June will be published, simultaneously with the ordinary Monthly Part for July, but quite independently of that Part, and sold separately, the EXTRA HOLIDAY NUMBER of CASSELL'S MAGAZINE for 1885, under the title of "BRIGHT DAYS."