

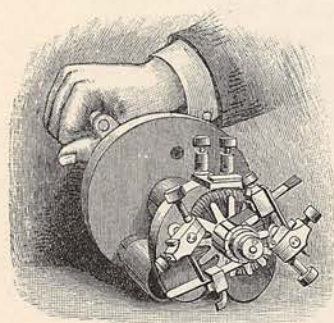
## THE GATHERER :

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

Correspondents are requested, when applying to the Editor for the names and addresses of the persons from whom further particulars respecting the articles in the GATHERER may be obtained, to forward a stamped and addressed envelope for reply, and in the case of inventors submitting specimens for notice, to prepay the carriage. The Editor cannot in any case guarantee absolute certainty of information, nor can he pledge himself to notice every article or work submitted.

### A Hand-Power Dynamo.

Our illustration represents a small hand-driven dynamo, capable of supplying sufficient current to



light a small incandescent lamp, actuate an induction coil, or perform a number of laboratory and lecture experiments in electrical science. The speed of the handle is multiplied by means of friction gearing. The apparatus can be fixed to a bench, and the

length of leverage of the handle can be altered at will. As voltaic batteries are troublesome and often dirty to use, the hand-power dynamo will probably supply a want.

### The Trans-Andine Railway.

The railway across the Andes from Buenos Ayres to Valparaiso is expected to be ready in 1892. The line is built with the exception of the mountain track, which is not yet completed. It crosses the Andes by the Cumbre Pass, where it runs through a tunnel over three miles long at a height of 10,450 feet above the sea. The grades are so heavy there that a rack rail is employed similar to that used on the Hartz and other mountain lines. Unfortunately, the line is not of one grade throughout, owing to the work being undertaken by different companies employing different gauges. While upon this topic we may also mention that the French have finally decided to build a railway across the Sahara, from Constantine in Algeria to Lake Tchad by way of Biskra, Timassiniss, and Amguid, a total distance of 2,000 miles. This direct route from France will open up the Western Soudan to French manufactures, and it is hoped to transform the desert into date plantations and fruit gardens by means of irrigation from artesian wells. Already the arid country in the south of Algeria has been

brought under cultivation by utilising the natural supply of water under the sands.

### Destroying Icebergs.

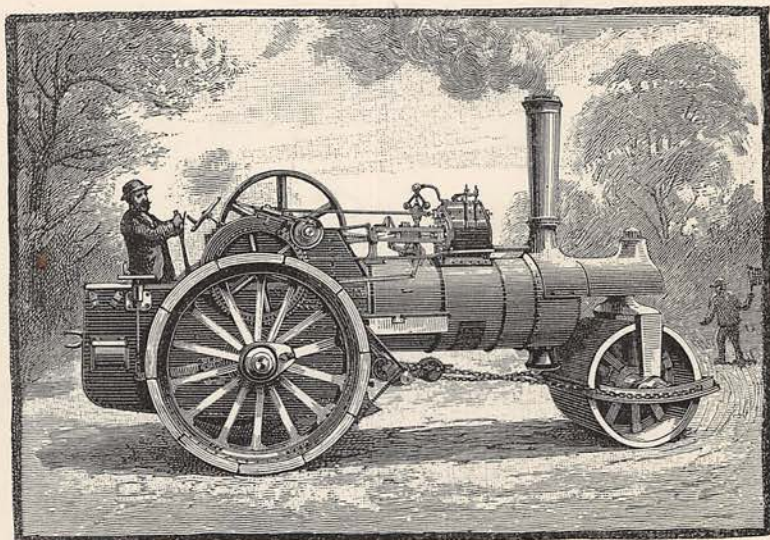
The icebergs which float from the Arctic regions into the Atlantic are dangerous to ships, and they have been unusually common this year. More than twenty were sighted during twenty-four hours in the course of the steamers plying between Liverpool or the Clyde and New York. The electric light and a careful outlook help the mariner to avoid them, but it would be better if they could be destroyed altogether, and hence the suggestion has been made that cruisers should be sent out by the Government to bombard them and break them up.

### A Steam Roller and Traction Engine.

The combined steam roller and traction engine which we illustrate will be useful both for hauling and rolling. It is simply a Wallis and Steeven traction engine of six horse-power, capable of hauling loads of fifteen to twenty tons. By removing the front axle and affixing a casting to which the front rollers are attached, the engine is quickly converted into a road roller. The machine thus serves a double purpose.

### A New Folding Chair.

The folding chair shown in our engraving, with an adjustable reading and writing desk attached, is well suited for a lounge, a library or deck chair, and a bed



A STEAM ROLLER AND TRACTION ENGINE.



at need. It is made in different styles, both cane and stuffed, and of the best materials. The wood is well seasoned, and the metal parts of wrought iron guarded from rust. To make an impromptu bed the back and arms are lowered, and a set of legs, till then concealed, are unfolded as a support. The chair when folded up for conveyance occupies a space two feet square by eight inches deep, and weighs only 45 lbs.

**Pine-Tree Soap.**

An American inventor has brought out a process for making soap from the resinous matter in the needles of the pine-tree. The resin is extracted by means of alkali, and the woody fibre is removed from the product, which, on addition of fat, yields an ordinary soap containing resinous and fatty acids.

**Illuminated Street Signs.**

In St. Louis, Missouri, U.S., the names of streets are printed on the globes of the electric arc lamps employed to illuminate the town, and the shadows of the letters are projected on the neighbouring wall or pavement so as to be read by the passengers. An English

firm has also introduced a street or station sign which is attachable to any arc lamp, and is readable by day or night. The figure illustrates one of these signs carrying the word "Eus-



ton," so as to be read from either side. It consists of a light brass framework with two plates of opaque glass on which the letters are plainly marked. A collar forming part of the frame is made to screw on the neck of the arc lamp, and the plates are thus hung on both sides of the globe, which thereby lights up the letters.

**The World's Fair.**

The Americans have at last decided on the site of the "World's Fair," or Great Exhibition of 1892. The situation will be in two parts: one a grass-covered common on the shore of Lake Michigan, near the business portion of the city. It comprises about 90 acres, which will be increased by reclaiming some submerged land and by bridging over the Illinois Central Railway. The other locality is the Jackson

Park, comprising about 550 acres of ground. These two sites will be connected by rail and steamer. The former, or Lake front, will contain the principal entrance and the art galleries; the latter, the agricultural and mechanical appliances.

**The Rotation of Venus.**

Professor Schiaparelli, of Milan, by patient observations of the planet Venus, has come to the conclusion that it rotates round its own axis in 224 days—that is to say, in a time equal to the period of its revolution round the sun. Its axis of rotation is also, he thinks, perpendicular to its orbit. Mercury, in his opinion, revolves round the sun in a manner analogous to the revolution of the moon round the earth, so that, like the moon, it always presents the same hemisphere to its primary.

**The Channel Telephone Cable.**

Aërial lines of four copper wires are being erected by the French and British Governments from Paris and London to the

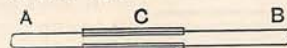


FIG. 1.

coasts of the Channel at San Galle and a point of Kent, and these will be joined by a cable of special construction, thus enabling London and Paris to converse by electricity. The cable will contain four copper wires, which, on being connected up to the four aerial wires, will form two complete metallic circuits or loops, each consisting of a going and returning wire. Each circuit, in fact, will be represented by Fig. 1, where A and B are the aerial lines, and C two wires of the cable.

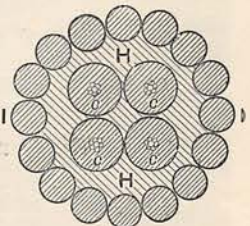


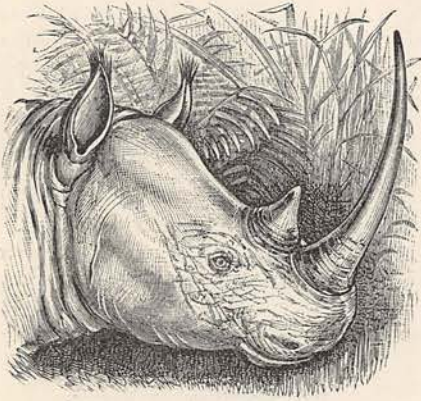
FIG. 2.

Each separate copper wire of the cable will be insulated with gutta-percha, and the whole sheathed in

tanned yarn and galvanised iron wires. Thus in Fig. 2, showing a section through the cable, *c c* are the insulated copper wires, *h h* the tanned hemp, and *i i* the iron sheath wires.

#### The White Rhinoceros.

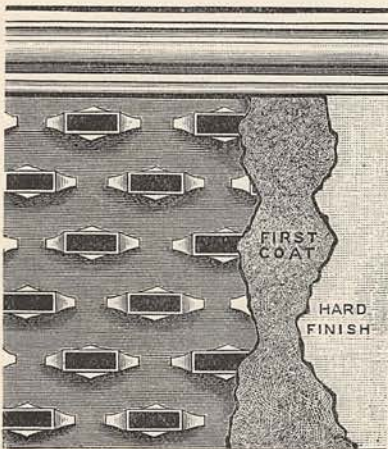
The largest known mammal except the elephant is the white rhinoceros (*Rhinoceros simus*), and it is believed to be all but extinct. In 1883 Mr. F. Selous shot a pair on the river Le-who-who, a confluent of the Umniati in Southern Mashuna-land, and if there are still one or two survivors they are likely to be found there or in Matabele-land. Surely an effort



should be made to preserve the animal from absolute extinction if possible. Failing this, it would be well to obtain a skin for stuffing, as there is none in any of our museums, but only a few bones to represent it. It differs from the black rhinoceros (*R. bicornis*) chiefly in having a square mouth, pointed ears, and elongated nostrils, as will be seen from our illustration of its head.

#### Fireproof Lathing.

A fireproof metallic lathing introduced from America is represented in our engraving. It consists of sheet metal—for example, iron—having openings of  $\frac{5}{16}$  by  $\frac{3}{4}$ -inch not far apart. The edges of these openings are



bent back so as to grip the plaster laid over the sheet, and hold it fast. The illustration shows the plate with the openings on the left, the first coat of plaster in the middle, and the hard finish or second coat on the right.

The lathing is very successful in the United States, and is said to render wooden houses or beams as fireproof as those of stone and iron.

#### The Tombstone of Tamerlane.

The tomb of the conqueror Tamerlane at Samarcand is constructed of dark nephrite, and the source of the stone has recently been found by M. Grombschewsky in the nephrite mines of Rasken-daria on the eastern slope of the Pamir, where it is found on the banks of a river, embedded in white jadite. Both of these stones were quarried for the Chinese at one time, but at the beginning of this century the heir to the throne of China fell ill after sleeping on a nephrite bed, and the mines lost favour.

#### An Alum Grotto.

A pretty crystalline ornament can be made by covering a small wooden cross with Canton flannel by means of brass wire nails, keeping the nap outside, and suspending the whole in a solution of alum. The latter is prepared by dissolving one pound of

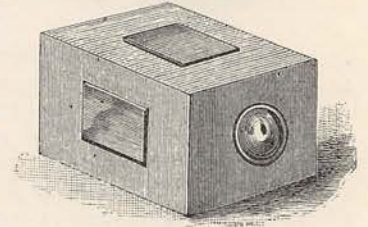


FIG. 1.

of hot water, and the cross is allowed to remain submerged until the solution cools. It will then be coated with sparkling crystals. A mimic grotto is also made by taking a box of wood or metal, having apertures at the top, ends, and sides, as shown in Fig. 1. The holes are corked and the interior is lined with jagged points covered with Canton flannel, having the nap outwards. The box is filled with the solution of alum, and after the crystals have formed on the flannel, the corks are removed and one end hole is covered with coloured glass. Over the front hole is placed a convex spectacle lens, having a focus about equal to the length of the box. When the interior of the box is illuminated by a strong light passing through the coloured pane, the effect is fine. Of course, the liquid should be poured out after the crystals have set, and the inside then allowed to dry. Fig. 2 represents the kind of artificial grotto which is produced in this manner.

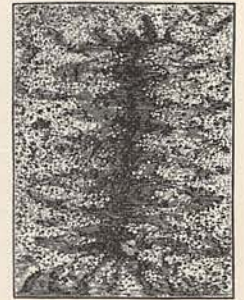


FIG. 2.

#### A New Method of Thrift.

"Accumulative Consols"—the words of Milton apply to the title: "What a name upon a title-page is this!" Yet it is the title of a method recently brought into use under which thrift is encouraged, and

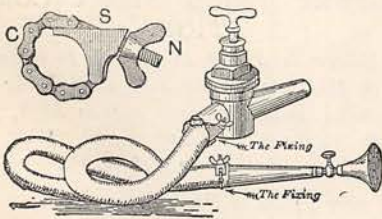
provision to some extent may be made for the future. Through the medium of Stock Exchange brokers, or through the Post Office, "consols" may be purchased at the fluctuating price of the day. For instance, a person may buy £500 of this Government stock. It costs him, suppose, £490, and for that £490 he receives from the nation £13 15s. per year, paid quarterly. In such a purchase there is obtained the highest security known to financiers; and thus many who desire to provide for the future by investing in some unquestionable security, purchase "consols." It was recently suggested that many such purchasers would be glad if they could allow the interest to be added to the principal—to *accumulate*, so as to increase the provision made; and this is what has been done. The Bank of England will now supply forms by which any owner of consols can order that the interest shall accumulate, and, as it accumulates, the Bank will use the accumulations to buy additional consols, as long as the total does not exceed £1,000.

An illustration will show the method. A professional man buys, say, £500 worth of consols, and requests that the interest may accumulate. The first quarter's interest is about £3 8s. 9d., and that amount would be invested again in consols, so that the second quarter's dividend would be on a little over £503; the third on £506, and so on, increasing until the total was needed for the purpose it was set apart for.

It may be added that any one dividend needed for special purposes may be obtained; that joint accounts may be opened, so long as one of the persons is of legal age; and that other modification occurs to fit the method of "accumulative consols" to the requirements of as many persons as possible.

#### A Hose-Fixer.

The figure illustrates a simple plan for fixing canvas or rubber hose to the metallic ends of taps, pumps, and hydrants. It consists of a short length of chain, C,



with flat copper links, which is connected to a brass saddle, and screw S, with a thumb-nut N. The inner surface of the saddle is curved so as to fit over the hose, and pressure is applied by turning the thumb-nut until a proper grip is obtained. The illustration shows two nozzles thus attached.

#### Recollections of a Musician.

A charming mirror of the life of a student in music, and of the influences which bore upon it, is presented in "My Musical Experiences," by Miss Bettina Walker, published by Messrs. Bentley & Son. The author expressly disclaims any intention of writing an auto-

biography, and in the course of her recollections she gives some vivid and pleasing pictures of several of the greatest of our contemporary musicians. Of Liszt she has some peculiarly interesting pictures to give. The life-like character of the work will no doubt earn for it many readers.

#### "Fresh-Water Aquaria."

How to make, how to stock, and how to keep a fresh-water aquarium, is the subject of an interesting little volume by the Rev. G. C. Bateman, the title of which heads this note. The book is published by Mr. L. Upcott Gill as the first division of a promised aquarium book, but any reader who follows out the author's directions will find in this volume all that he needs in the way of instruction and advice upon the management of a fresh-water aquarium.

#### For Students.

We are glad to welcome the first part—of three—of "The Student's History of England," by S. R. Gardiner, the well-known historian. The work is intended for the use of students who already have an elementary knowledge of English history, and it will be found none the less acceptable because of the illustrations by which it is accompanied. Messrs. Longmans (the publishers of the work) are to be congratulated on the handy form in which it is issued, and which will enable students to carry it about readily. This first volume only takes us to the beginning of the sixteenth century, but if the succeeding volumes are as thorough, this work will be an acquisition to our educational library.

#### Seasonable Publications.

No one can have failed to remark the frequency with which old-time ballads and songs have been republished, with numerous illustrations, during the past few years. This season the custom is again prominent, and Messrs. Eyre & Spottiswoode are to the fore with new and illustrated editions of "The Jolly Young Waterman," and "A Hunting We will Go." The illustrations to these two works are excellently reproduced in facsimile, and we can commend the books as pleasant companions for an idle hour. In Christmas cards Messrs. Von Portheim & Co. offer some striking novelties. As in recent years, new shapes and designs are introduced, among the most striking being miniature fans, that actually open and shut, and stamped leaves of flowers which open and disclose prettily coloured pages. Tennis racquets, eggs, stirrups, and gateways, are all pressed into the service with very good and striking effects. Some designs in relief and others with metallic backgrounds are among the prettiest that Messrs. Von Portheim are sending out this year. We have again to notice a series of little booklets of theirs stamped to represent various flowers, and enclosing beautifully coloured little pictures and verses. With their cards Messrs. Von Portheim have issued a decided novelty in some booklets of landscape studies in water-colour and black and white respectively, and unaccompanied by

any letterpress. For drawing-room tables and as suggestions for young artists, these cleverly designed and carefully executed books are sure to be much appreciated. Among other booklets of theirs we notice a charming little illustrated edition of "Lucy Gray," and two other collections of poems and pictures, entitled "Sweet Solitude" and "Where Fancy Dwells," both remarkable for the delicacy and finish of their colour-printing, a feature that is indeed characteristic of all Messrs. Von Portheim's work. Perhaps their most striking novelty this season is in a series of writing tablets suitable either for a lady's "davenport" or an office table. The tablets are perforated so that each leaf may be readily detached, and each tablet is enclosed in a case decorated by a prettily coloured picture. Messrs. Marion & Co. have introduced a striking novelty this season in a number of pretty frames for photograph or greeting cards, which enable the sender to convert a portrait, or view of some familiar place, into a Christmas or New Year souvenir that shall be of lasting value. On the frames are printed seasonable greetings, and the shapes used are very varied and taking. The frames have one great advantage in the fact that they are all self-supporting, and many of them are fitted with a most ingenious little elastic contrivance for holding a card or photograph which could not otherwise be mounted.

#### A New Book for Children.

"Wanted, a King," is the title which Miss Maggie Browne gives to a most delightful children's book which has just been published by Messrs. Cassell, with illustrations by Mr. Harry Furniss. We will not spoil the perusal of the work by revealing the plot, but we commend it to those who wish to give their young friends an attractive Christmas present. Little Merle's dream about the characters all children know so well in nursery rhyme, brings into the story many an old nursery favourite, who will no doubt be welcomed with the undying enthusiasm that is due to such dear friends. The book is one of the best and most attractive for children that we have seen for a long time.

#### Character in Handwriting.

It is the fashion nowadays to discover characteristic traits in everything that we do or are. Our fathers used to be content with the evidences of physiognomy, but we have long passed that stage, and the bumps on our craniums, the lines on our palms, and the strokes of our caligraphy are all pressed into service as revealing our character. There is doubtless more to be said for the impress of character on handwriting than for some other "evidences" which have been held infallible by enthusiasts. Our friend, Mr. Henry Frith, has written a little work which he calls "How to Read Character in Handwriting; or, the Grammar of Graphology" (Ward, Lock, & Co.), in which he has reduced the art to a science, and by means of specimens of handwriting he shows how the veriest tyro may read something of his friends' characteristics from their letters. The study is an amusing one at any rate, and cannot do any harm, and that Mr. Frith's

rules are to some extent safe we can vouch by the fact that several of the specimens he gives are those of persons known to us.

#### Old Friends in a New Dress.

Our readers will perhaps remember a special article in this Magazine about the time of the publication of Sir Robert S. Ball's "Story of the Heavens" (Cassell & Co.) We are now glad to see a new edition of this useful work at a price bringing it within the reach of a larger circle of readers, to whom it might well serve as a guide in the study of the heavens during the dark nights of winter. This work is intended primarily for older readers than the same author's "Star-Land," which recently attracted Mr. Gladstone so keenly. Another new edition before us is a second edition of Mr. E. J. Wall's "Dictionary of Photography" (Hazell, Watson, & Viney, Limited), which is adapted for both amateur and professional photographers, and has been found most useful by many of our own acquaintances. Mr. Fisher Unwin sends us the fourth edition of "English as She is Taught," an amusing collection of answers to school examination questions, with a little commentary from the pen of Mr. Mark Twain; and with it, in a little volume uniform in shape and size, the sixth edition of "Stops; or, How to Punctuate," a really practical little manual. Messrs. Jarrold have just issued in a single volume a number of the papers which a writer in our department of the "Family Doctor" has contributed to this Magazine. No doubt many of our readers will be glad to have them in this handy and permanent form. Messrs. Longmans have issued a greatly enlarged, and in part re-written, edition of "Essays on Educational Reformers," by Robert Herbert Quick, a work giving admirable criticisms of the best known of ancient and modern educational systems.

#### FOUR-PART PRIZE STORY COMPETITION.

*The Editor is happy to be able to announce the award in this competition, and, though the average of the stories submitted was not so high, perhaps, as in the Eight-Part Story Competition, to congratulate the competitors on their work.*

*The FIRST PRIZE of £40 is awarded to*

IDA J. LEMON,  
186, The Grove, Hammersmith, W.

*The SECOND PRIZE of £30 to*

CLARA E. CHEESEMAN,  
Reumera, Auckland, New Zealand.

*And an EXTRA PRIZE of £25 has been awarded to*

FRANCES PUMPHREY,  
Elm Park, Shotley Bridge, Durham.

*Competitors who have not already done so are requested to send for declined MSS. without delay, as the Editor cannot be held responsible for them after this notice.*