

THE GATHERER:

AN ILLUSTRATED RECORD OF INVENTION, DISCOVERY, 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 Reservoir Reflector.

Our figure shows a reflector for gas lamps indoors, which at the same time absorbs the heat of the flames, and tends to keep the rooms cool.



RESERVOIR REFLECTOR.

The reservoir, R, contains water, and is open to the air, so that the heat is absorbed in evaporating the water, which renders the air sufficiently moist to be pleasant. Tobacco-smoke and the gaseous fumes are also absorbed, and, if required, a disinfectant, such as permanganate of potash, can be added to the water. By means of a siphon arrangement, the reflector can be emptied and filled with fresh water in a few minutes without having to touch the water.

Indiarubber Curtains.

Curtains of an indiarubber composition, containing 75 per cent. of the gum, 3 per cent. of wool dust, 5 per cent. of pulverised fruit stones, 10 per cent. of bleached amber varnish, and 5 per cent. of bleached leather waste, with a little infusorial earth, have been introduced on the Continent. The ingredients are worked into a paste by means of bisulphide of carbon and rolled into thin sheets, which are decorated with pleasing designs.

Poison in Dolls.

M. A. Bulowsky, a foreign chemist, has recently shown that children's india-rubber toys—such as are used on the Continent at least—sometimes contain harmful pigments. Black dolls, for instance, are often coloured in the mass with lead salts, and red rubber articles with sulphide of antimony, which, however, does not dissolve in the saliva. Grey rubber goods usually contain zinc oxide,

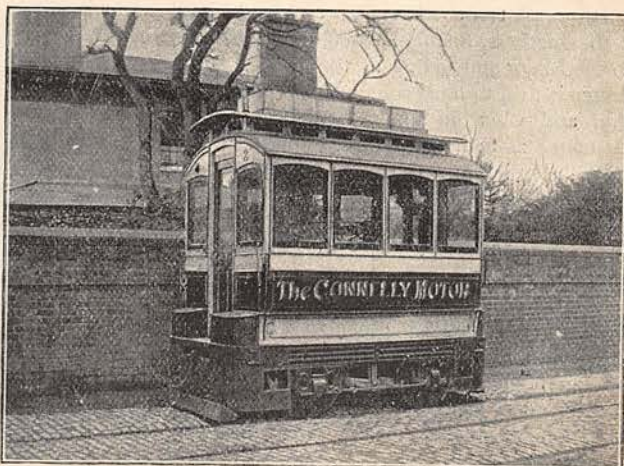
and are therefore dangerous, especially if brought to the mouth. Surface colouring is also effected by injurious pigments, and it is probable, he thinks, that many childish ailments are really due to this unrecognised cause.

A Glaze Frost.

A remarkable "glaze frost" occurred during the past winter in Roumania. This natural phenomenon is attributed to rain falling and instantly freezing on the surface of the ground cooled below the freezing-point, and it covers them with a smooth coating of ice. In Roumania, however, the cause seems to have been that the raindrops were already cooled below the freezing-point and only needed contact with some hard surface to freeze them, as the surface of the ground was above the temperature of the freezing-point. The frost coated the telegraph wires near Bucharest with ice and icicles to the diameter of an inch or more and broke them down. Trees were also snapped across and branches torn off by the weight of the ice.

A Gas-motor Car.

A new motor for drawing tramcars, in lieu of horses, has been introduced into England from America. It is the invention of Mr. Connelly, and the motor is a gas-engine worked with compressed coal gas or with oil gas. The explosions of the gas are noiseless, there are no disagreeable fumes, and the speed is easily regulated. Our illustration gives a general view of this locomotive, which can also be combined with the car in one vehicle.



THE CONNELLY MOTOR. (From a photograph.)

The Roof of Asia.

The great Dapsang Plateau, in the Pamirs, has been called the "roof of Asia." It was visited by Lord Dunmore during his travels in that region, when, by the aneroid barometer, he found its elevation no less than 16,000 feet above the sea. Nevertheless, no discomfort was experienced from the mountain sickness caused by exertion in the rarer atmosphere of high altitudes.

The Moth as a Mimic.

An interesting case of protective mimicry is related by Mr. G. H. Cotton, of Hiram, Ohio, U.S., in an American scientific journal. One day he observed the stub of a branch projecting from the trunk of a young cherry tree which he had recently pruned, and, wondering how he had overlooked it, drew out his



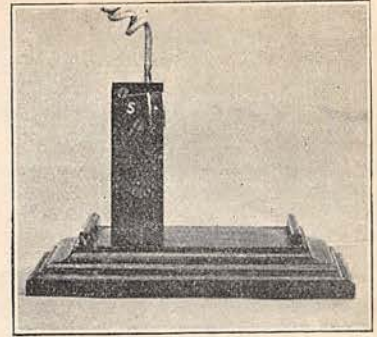
THE MOTH AS A MIMIC.

pocket-knife to cut it away, but found that he had startled a moth. The insect was attached by its head to the bark, which it closely resembled, and at the usual angle of the branches as shown in the sketch above. Moreover, the abdomen being white resembled the end of a decaying branch.

A Great Fireball.

On January 25th last, about 10 p.m., a magnificent fireball or meteor was seen in the heavens over a great section of Worcestershire and other adjacent parts of the country. It appeared to travel from north-north-west to south-south-west, and is described as having been double-headed, of a bluish lustre in the heart, and yellow at the edges. Its brilliance is said to have equalled that of the electric arc, and when it finally exploded, at a point estimated as being near Tewkesbury and sixteen miles high, it emitted flashes which turned the night into a kind of day, and left a long luminous trail of fire. Several detonations followed its disappearance, the last of which was so violent as to rattle crockery and shake houses in the manner of an earthquake. Whether it was an instance of globular lightning or a meteoric stone is not quite certain, as no traces of any fragments have been found, but it was probably the latter. Next evening about eight p.m. a curious meteor was observed at Croydon by Mr. J. Munro, who has described it as a "black aurora." Five dark rays or streamers,

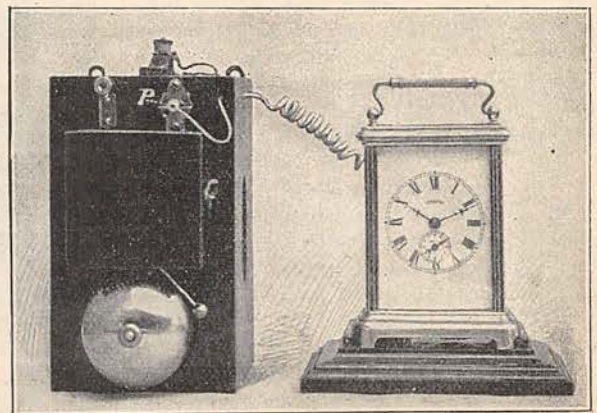
like the blades of a fan, extended from a point above the northern horizon nearer to the zenith or the magnetic zenith. Seen against a hazy sky illuminated by the glare of the metropolis, they resembled streaks of a gigantic brush dipped in Chinese ink, and the whole system wheeled slowly towards the east through an arc of 30° to 40° , then faded out. We may add that about the end of the past year, a ship bound from Australia to San Francisco encountered a severe hurricane, and suddenly found herself in a part of the sea which was dead calm. At the same time she became enveloped in a sheet of bluish light up to the very tops of the masts and of blinding lustre. The phenomenon, which was doubtless a remarkably fine display of St. Elmo's Fire, disappeared as suddenly as it came.



AN ELECTRIC CLOCK ALARM.—FIG. 1

An Electric Clock Alarm.

Our illustrations show an electric clock alarm which is the invention of Mr. Fielder, and is at once simple and efficacious. The clock may be of any shape, the only qualifications being that it shall fit the stand provided (or have the bottom of the stand adapted to it) and that the winder of the alarm shall project at the back of the clock. But the clock is not connected with the apparatus, and may be used, apart from it, in another room, if desired. When the alarm is to be used, the clock is wound up, the alarm set, and the clock placed firmly on the stand, so that the winder of the alarm is pushed inside the slot, S, shown at the back of the stand. When the time arrives for the alarm to come into action, the bell attached to the battery will ring until the peg, P, is taken from its place in the battery case, an arrangement which, in



AN ELECTRIC CLOCK ALARM.—FIG. 2.

the case of the bell being used to awaken a servant, ensures her being compelled to get out of bed to silence the alarm. The electric current does not pass through the clock or any part of its mechanism, and by an ingenious arrangement the metal contact plate at

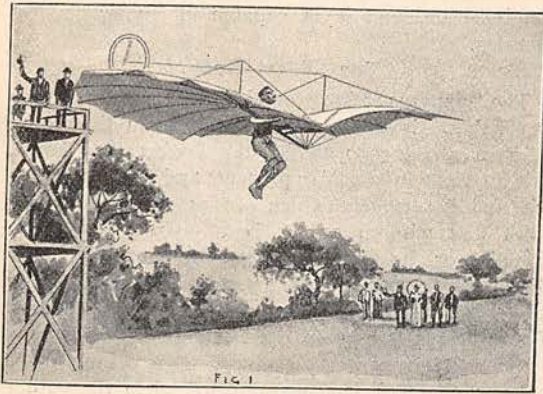


FIG 1.
AN AERIAL TOBOGGAN.

the back of the clock stand may be used as a "push" and the bell used for calling assistance of any kind, irrespective of the alarm.

An Aerial Toboggan.

The legend of Dædalus and Icarus of Crete is the mythical germ of aeronautics; but it is on record that one Besnier, a Frenchman, attempted to fly, or rather float, through the air in 1678. According to the *Journal des Scavans* of December 12th that year, he made several trials with four inverted V-shaped floats attached to his person. Again in 1742 the Marquis de Bacqueville, a French courtier, attached floats or wings to his arms and ankles, and jumped from a balcony of his house on the Quai des Theatins, Paris, with a view of floating over the Seine to the Jardins des Tuileries, but fell on the roof of a washing-boat moored near the riverside, and broke his leg. It may now be said that the problem of flying has entered on the scientific stage, and is attracting the attention of serious and able theorists and inventors. Professor S. P. Langley of the Smithsonian Institution, Washington, U.S., recently declared that he saw nothing to hinder us from constructing a flying machine, which could fly round the world, by simply utilising the force of the wind itself, with an occasional help from a steam or other engine carried by it, when there was little or no wind. This remarkable deduction is based on his discovery that a wind consists of irregular puffs or beats, and that a bird is able to soar by adjusting its wings and body so as to catch and profit by the impulse of these gusts. His idea is to construct a machine, or "aerodrome," on this principle, with means of adjusting the wing or catching surface to reap the full advantage of the irregular air-currents making up the wind, and provided with spare engines to drive the machine when the wind fails. We may also add that M. Tshernoff, a Russian physicist,

recently brought a new theory of flight before a scientific society in St. Petersburg. His paper has not been published in this country as yet, but he endeavours to show that the flight of a bird depends on the principle of inertia rather than on the resistance offered by the air to the surface of the wings. Of practical experiments in the same direction the most interesting are those of Herr O. Lilienthal, at Steglitz, near Berlin. The German has constructed an apparatus consisting of two large wings, curved like a bird's and made of linen stretched on a wooden frame with an aperture in the middle of it, as will be seen from our illustrations; and having put the wings over his head so as to rest on his shoulders he takes hold of the frame and leaps from the top of a hill or high building against the wind, and thus getting the benefit of the upward or bearing force glides gently down to the ground at a slope of 10° or 15° from the horizontal. The surface of the wings is about 15 square metres, and they are able to carry him about 250 metres, or, let us say, yards, before he touches the ground. He can incline the wings' surface a little, and thus quicken and slacken his speed, or change his direction. If the wind is not too strong and the wings too large, there is apparently little danger in this kind of aerial tobogganing, which may yet become a novel form of recreation. Even the aged Professor Du Bois Reymond has in this way jumped from a height of 100 feet and landed safely, a feat which suggests the use of the wings as a fire escape.

The Mammoth Crystal Cave.

America can boast of the finest caves in the world, so far as known. She has not only the mammoth cave of Kentucky, one of the natural wonders of the world,

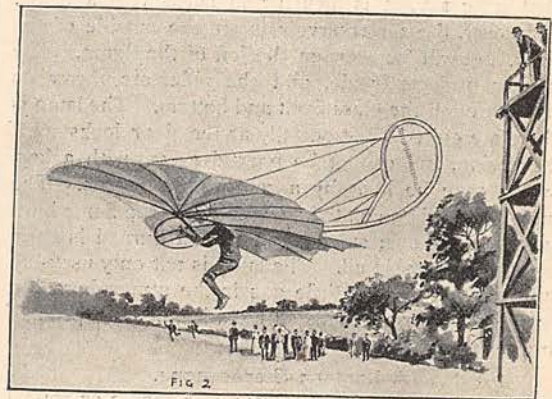
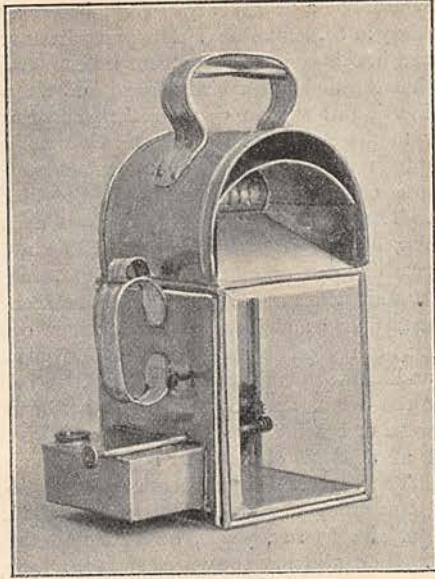


FIG 2.
AN AERIAL TOBOGGAN.

but the marble cave of the Ozark Hills, the Wyandotte Cave, the Luray Cavern of Virginia, and others of the stalagmitic formation, but she has a crystal cave, discovered in the Black Hills by a party of miners, and not yet explored to its full extent. It is estimated that this cavern comprises forty or fifty miles of underground passages in several tiers, forming a natural labyrinth. It has been formed in strata of



A DOWNCAST LANTERN.

corniferous limestone by a creek which pursues an underground course for eleven miles at this spot. The peculiarity of the cave is that it is lined on walls, floor, and ceiling with crystals of dog-tooth spar, which, when lighted up, present a glittering spectacle. The cave is surrounded by beautiful scenery, and will, no doubt, become a favourite resort of the tourist.

A Downcast Lantern.

The portable hand-lamp which is shown in our engraving sheds its light below as well as in front, and fulfils the requirements of the fire insurance companies in the case of corn-mills and other classes of factories—that is to say, it is locked and burns vegetable oil. Moreover, the oil reservoir is on the outside of the door, and will be seen on the left of the figure. The burner projects inside, and the reflectors throw its light through the glass front and bottom. The lamp is therefore quite safe, especially as the door locks itself on closing, and cannot be opened except with a key, which may be kept by a responsible person. The supply of air is regulated so as to make the flame burn nearly all its own smoke, and the oil burned is colza or other vegetable oil. The lamp is not only useful in mines where there is little gas in the atmosphere, but in flour- and other mills or factories, not to speak of ordinary premises.

A Lantern Stereoscope.

There has long been a want of a magic or optical lantern which would project pictures on a screen and make them appear solid, like photographic images seen through the stereoscope. This has now been invented by Mr. John Anderton, and the apparatus is virtually a double lantern, projecting the images of two stereoscopic transparencies and superposing them on the screen. When seen by the naked eye the combined images on the screen are blurred and misshapen, but when the observer looks through a small eyeglass provided for the purpose the true

proportions, distinctness, and solid effect is obtained. This result is brought about by polarising the two beams of light which project the images in planes at right angles to each other, and the eyeglass or lorgnette contains a pair of analysers. The lantern can be used for projecting in the ordinary way by a simple manipulation, and it is capable of giving ten-foot pictures.

The Oldest Book.

The "papyrus prisse" found by M. Prisse in a tomb at Thebes, Egypt, is the oldest book in the world. Written about 3350 B.C. by the Prefect Ptah-hotep, it is a collection of golden precepts and meditations on life and government which are as modern in their spirit and wisdom as the best sayings of Marcus Aurelius or the finest moralists. In fact, they show that in Egypt 5000 years ago there was a tone of culture and refinement equal to that of the best modern ages. The papyrus is now in the Bibliothèque Nationale, Paris, and is very well preserved. It is written in the hieratic character, and was finished when the author attained the patriarchal age of 110 years. Ptah-hotep, as a prefect, filled an office only second to the Pharaoh of his time, King Assa, namely that held by Joseph. He was Keeper of the Royal Granaries, Chief Justice, Chancellor of the Exchequer, and Lord Chief Justice all in one.

PUZZLE MAZE COMPETITION.

AWARD.

The Prize of ONE GUINEA has been awarded to
S. V. HORTON,
Llanbadarnfawr,
Aberystwith.

Extra Prizes of HALF-A-GUINEA each have been awarded to

WILLIAM L. FRENCH,
75, East Hill,
Colchester; and

GERTRUDE GOODMAN,
94, Oakfield Road,
West Croydon.

HONOURABLE MENTION is accorded to

WILLIAM H. SORBY,
72, Alexandra Road,
South Norwood.

DEBATE COMPETITION.

The Prize of TWO GUINEAS has been gained by
The Rev. J. M. DRYERRE,
The Manse,
Innerleithen, N.B.

HONOURABLE MENTION is accorded to

JAMES ALEXANDER, Huntly;
F. AUSTIN, Petworth; and
AMYAS SELWYN, Newcastle-on-Tyne.

The work of the successful competitors will be published in our pages in due course.