

## 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.

### The Hippometer.

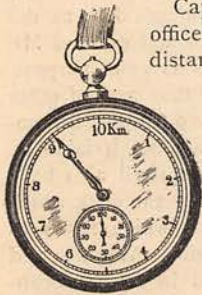


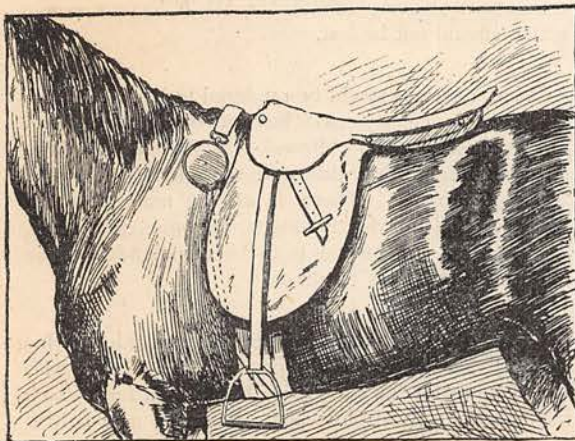
FIG. 1.

Captain Buisson, a French cavalry officer, has invented a pedometer, or distance-measurer, for horses, which he calls the hippometer. It resembles a watch, as will be seen from Fig. 1, and is like the pedometer, which indicates the distance a person walks. The mechanism is actuated by the shock of the footfalls. The instrument is carried in a leather case, and strapped to the horse after the manner shown in

Fig. 2. Its error is stated not to surpass four per cent. of the distance travelled.

### A Cure for Lockjaw.

It has been ascertained by M. Kitasato that the terrible disease known to science as tetanus and to people in general as lockjaw, is caused by a bacillus, and applying the method of the illustrious Pasteur he has succeeded in preventing and curing it by subcutaneous injections. His experiments were conducted on guinea-pigs and mice which were infected with the disease by inserting small splinters of wood containing the bacillus under the skin. All who were subsequently inoculated with the protective lymph he has prepared recovered, and all who were left alone perished of lockjaw. The sooner the inoculation was performed after the infection had been communicated the speedier the cure, and when both occurred simul-

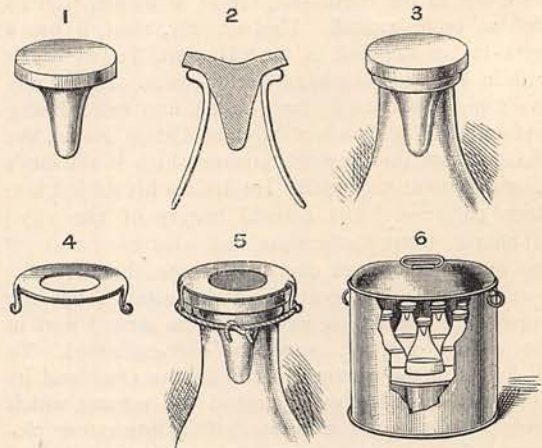


THE HIPPOMETER.—FIG. 2.

taneously no symptoms of the disease appeared. The protective and curative lymph was prepared from the serum of a horse which had been artificially rendered proof against tetanus. The importance of this discovery is all the greater inasmuch as the bacillus of tetanus retains its vitality for many years.

### A Germ-Tight Stopper.

Milk sterilised by heating is now so much recommended for invalids and babies that a French inventor has introduced a hermetical cork or stopper, which we illustrate. It is simply a disc of red caoutchouc, with

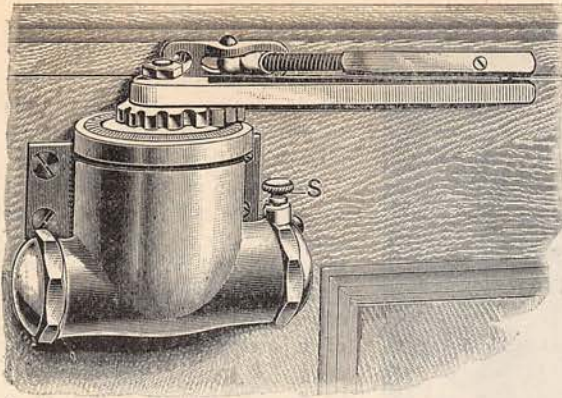


a conical projection on its underside which goes into the neck of the flask or bottle, as shown at 1 in the figure. The milk is sterilised by immersing the bottle in boiling water, and then cooled by withdrawing it, when the partial vacuum in the bottle sucks the cork tight, as shown at 2. A cap (3) is then placed over the rubber, and a washer (4) over that, having lugs by which the whole is tied to the neck of the bottle, as shown at 5. The pitcher (6) is designed to sterilise a number of bottles at the same time.

### An Adjustable Door Spring.

The small and compact door spring and check which is shown in the illustration has no unsightly external rods and cylinders, and is quite noiseless in its action. Moreover, by means of a regulating thumb-screw, S, the door can be adjusted to close





AN ADJUSTABLE DOOR SPRING.

at any speed, and slamming prevented. The check is made in four sizes, to suit the description of door.

#### The Growth of Children.

Observations made at Worcester School, New England, have shown, as a rule, boys' heads are longer than girls', although the average difference varies, it being three millimetres at the age of eleven to thirteen, and six or seven millimetres afterwards. A girl's head ceases to grow at eighteen, and a boy's at twenty-one. The head grows and ceases to grow in breadth by turns. Girls' heads are narrower than boys' till their eleventh year, then about the same width till their fourteenth year, when the boys' heads again become wider than the girls'. At seventeen a girl's head ceases to grow in breadth, and a boy's at twenty-one. It is much the same with breadth of face. As for stature, boys at five are taller than girls, but the latter overtake them at the seventh year, and the boys only recover the lead at the ninth year. At the twelfth year the girls shoot up taller than the boys until the fifteenth year, when the boys finally distance them. Girls cease to grow at seventeen, and boys keep on for a few years longer. Comparing the length of head with the stature, girls' heads are shorter in proportion to their height than boys' until the fifteenth year, when the girls take the lead, and so women have proportionally longer heads than men. The same is true of width of head and also of the breadth of face.

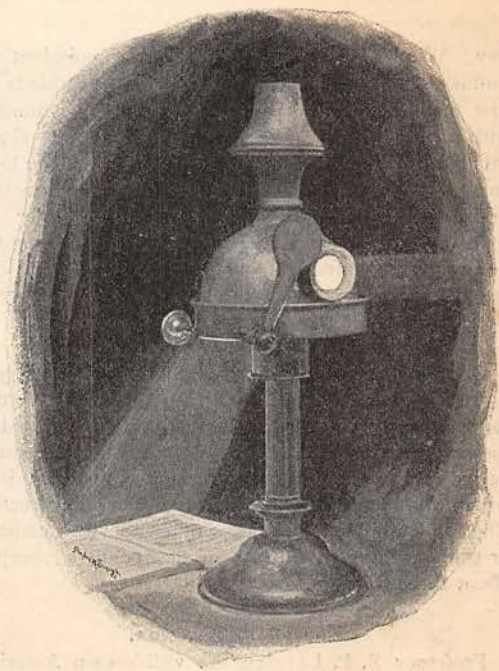
#### A Giant Cypress.

At Saint Remy de Provence, in the province of Bouches-du-Rhône, France, there is a pyramidal cypress of Crete which exceeds in magnitude all with which we are acquainted, not excepting those of Broussa or the Cemetery of Eyoub. It is over nineteen metres high, and its girth a metre from the ground is over five metres. The foliage covers a space of thirty-three metres in diameter, and is capable of sheltering two waggon-loads of hay. Its age is estimated as six hundred to seven hundred years. In his "*Dernier roi d'Arles*" ("Last King of Arles"), the Provençal poet, Amédée Pichot, asserts that it was

planted on the tomb of Passeroun, the legendary horse of Dragonet de Montdragon. "Dragonet," he writes, "assisted the peasant to transplant on the grave of Passeroun a young cypress, and surrounded it by a hedge of woven reeds. This tree, whose trunk resembles an enormous cable of serpents, attests to-day the renown of the fairy courser. As sacred as the elms of Bavioca, this tree is the wonder of the land. Its vigorous age has defied the centuries. In vain the lightning has struck it, for it has covered its scars under new verdure; in vain the hostile axe has mutilated some of its branches, for it has only pushed forth more." The cypress was a celebrated tree in ancient times. Doctors sent those who suffered from chest affections to breathe the balsamic odour of the Cretan cypress. The wood was considered incorruptible.

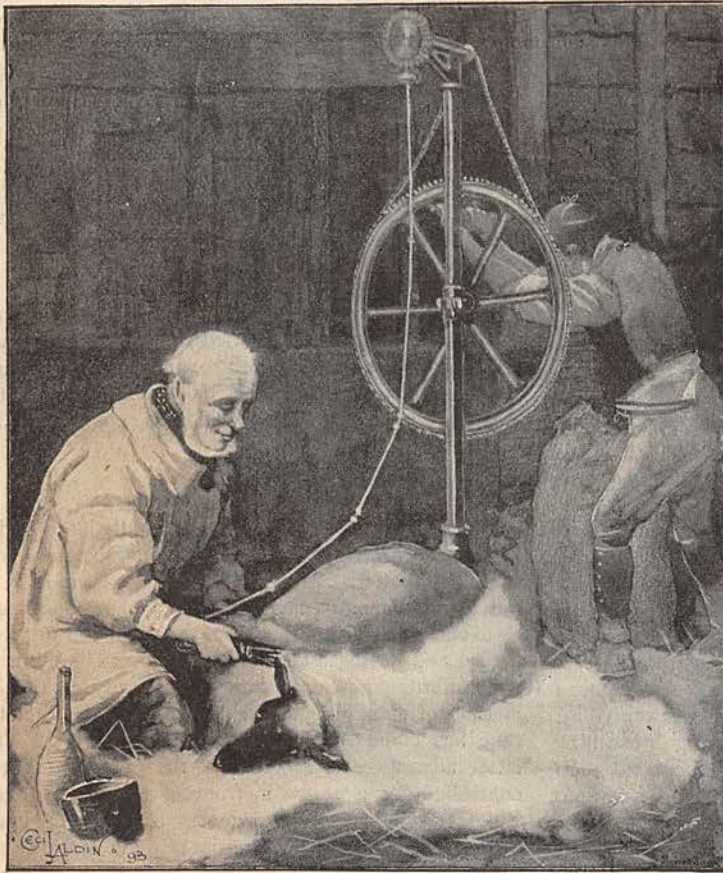
#### A Candle Lamp for Lecturers.

Our illustration pictures a new candle lamp which has just been introduced for the use of lecturers who use magic-lanterns. As will be seen, the lamp is by no means unornamental in appearance, and it is so devised as to cut off all white light from the room and to throw a clear and steady light upon the lecturer's manuscript, while affording him at the same time a ready and reliable method of signalling to the lantern operator that the time has come for the slides to be changed. This latter advantage is secured by the use of a shutter controlled by a screw in front of the lamp screen, which, on being raised, uncovers a red signal glass, through which a clear crimson beam is shown to the operator as long as the lecturer's hand is on the screw



A CANDLE LAMP FOR LECTURERS.





A NEW SHEEP-SHEARER.

key. We believe that this method of noiseless signalling is not new in lecturers' lamps, but this is the first instance in which we have met it in connection with a candle lamp. We should add that the value of this lamp is much enhanced by the fact that the lower part of the stand, shown in our illustration, uncloses and reverses to make a cap for the burner and reflector while in transit, thus effectually reducing to a minimum the chance of any grease or dirt being conveyed by the lamp to anything with which it may be packed.

#### A New Sheep-Shearer.

One of the latest machines for shearing sheep is illustrated herewith. The principal novelty in it is the flexible driving-shaft of steel rods connected by toothed gearing. The cutting teeth of the shears derive their motion from it through a universal joint, which allows the shears to be turned in any direction. The implement can be readily taken apart for cleaning or transport, and is capable of defleecing a sheep in about three minutes.

#### Energy and Vision.

Professor S. P. Langley, the well-known American physicist, has by a series of experiments found among other things that about half a second is required for

the eye to perceive an excessively faint light. When the eye is exposed to a bright light it afterwards requires a still longer time to recover its sensitiveness, especially if the light is a violet one. The amount of luminous radiant energy required to make us *see* varies greatly with the colour of the light, and in different eyes. Thus, if we represent the luminous effect of a crimson light as 1, that of a green light of the same energy is 100,000, that of a blue 62,000, of a violet 1,600, of a yellow 14,000, and of a red 1,200.

#### A Long Distance Water-Level Indicator.

An ingenious apparatus has been installed at the Wigan Waterworks to indicate the level of water in a reservoir half a mile distant. It is illustrated in the accompanying figures, and consists of a cast-iron box, B, Fig. 1, about six inches in diameter, having a spindle, S, which passes through it and carries a toothed wheel, W, over which runs a chain having its lower end fastened to a float in the water, and its upper end attached to a compensating weight, so that the rise and fall of the water causes the wheel to turn to the right or left as the case

may be. Inside the box an electric contact-maker or commutator is fixed to the spindle and revolves with it. From this commutator an insulated conductor, C, runs to the distant station, where they

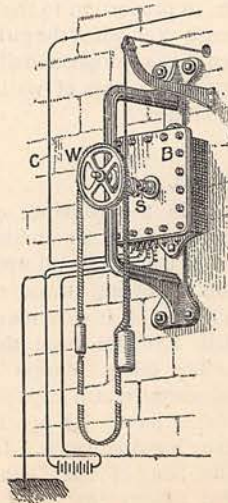


FIG. 1.

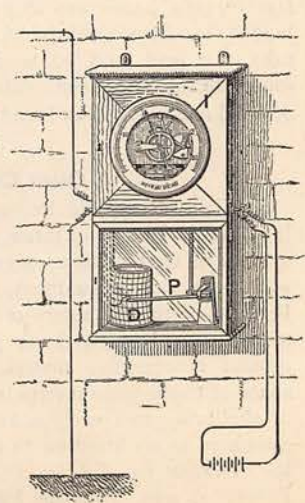


FIG. 2.



are connected in circuit with a battery and the receiving part of the apparatus, Fig. 2. This consists of a dial indicator, I, seen above, and a recording pen, P, seen below. A series of electromagnets receive the current from the transmitter at the waterside and work the needle of the dial indicator and the pen of the recorder in one direction or the other as the water rises and falls, thus producing a permanent curve of the water-level on the revolving drum of paper, D. The earth is used as a return wire for the circuit, and the apparatus is quite automatic.

#### Telephoning with Gas-Pipes.

M. G. Mareschal, having observed that by connecting the gas and water mains near his house through a galvanometer he obtained a current of electricity, was led to try whether these pipes would not serve as telephone lines. Accordingly, he fitted a telephone at his own and a friend's house, the connecting wire being replaced by the pipes. He was not only able to converse with his friend quite well, but he was able to hear music in several other houses *en route*. Moreover, he was able to overhear the Morse signals on a neighbouring telegraph wire. "Tapping the wire" is an offence in America, where it is sometimes done for fraudulent purposes; but if the gas and water pipes of a house lend themselves so easily to the practice it will be difficult to find the culprits.

#### Electricity from the Coal-Fields.

The success of the Frankfort to Lauten experiment on the transmission of power by electricity a distance of 110 miles has emboldened two English electricians, Messrs. Thwaite and Swinburne, to propose a scheme for generating electric power at coal-fields and distributing it to various parts of the country. The coal-fields of Yorkshire might in this way supply London with electricity, and also the intermediate towns along the line. The project is undoubtedly feasible, and it is probably only a question of time ere it be put in practice.

#### Things Great and Small.

Professor J. I. D. Hinds, of Lebanon, Tennessee, has drawn attention to the extremes of the plant world: the "big trees" of California on one hand and the microscopic bacteria on the other. Some of the trees are nearly four hundred feet high and ninety feet in girth. Some bacteria, on the other hand, probably escape the highest powers of the microscope. Thousands of them could swim side by side through the eye of a needle, and one could hold billions of them in the hollow of his hand. A big tree is therefore thousands of millions of millions of millions of times larger than a bacterium. There is about the same ratio between them as that of the earth to a football. This, be it remembered, is just the proportion between a drop of water and the atoms composing it, as estimated by Lord Kelvin. The average life of many bacteria is about an hour; that of a big tree is probably three thousand years. Hence the tree has outlived twenty-six millions of generations of its invisible kindred in the stream hard by. "As many bacteria," says Professor Hinds, "could be laid side by side on a linear inch as

earths upon the diameter of its orbit around the sun. Compared with the tree, the bacterium is almost infinitesimal; by the side of the earth the tree is insignificant; in the solar system the earth is but a small factor; and if the solar system were annihilated it would be millions of years before its loss would be felt on distant stars. Magnitudes are therefore relative, and things are great according to the standpoint from which we view them."

#### A Violoncello-Piano.

Professor Vlamminck has invented a combination of the piano and the violin or violoncello which can be played by one person using a hand to each. The neck of the violoncello goes into an aperture below the piano, thus bringing both instruments within range of the player. For rendering such pieces as Mendelssohn's "Songs Without Words," or the melodies of Schubert arranged for violin and piano, the new instrument is very well adapted, and it is much smaller than the ordinary piano. Very ingenious, no doubt.

#### Feather Tapestry.

Mrs. Zelia Nuttall, a well-known American archaeologist, especially in Mexican antiquities, has not only discovered the secret of the ancient Mexican calendar so long a puzzle, but has good hopes of recovering the lost Mexican art of making pictures or tapestry work in bird feathers. In the Royal Armoury at Madrid she has found a shield of Philip II. of Spain which is covered with representations of scenes from Spanish history in the fine mosaic of this feather-work, and by a critical study of it she expects to reveal the *modus operandi* of the lost art.

#### A Knee-Cradle.

A knee-cradle, for the use of housemaids and other servants who are engaged in the cleaning of floors and steps, has just been patented. Its construction is very simple. Into a block of wood, some fourteen inches long, are let two pieces of cork which are hollowed to fit the knees. The whole is mounted upon two slightly curved rockers, which, with the cork cushions, goes far towards making cramp a thing of the past, and also towards guarding against damp.

#### PRIZE COMPETITIONS.

OPEN TO ALL READERS OF "CASSELL'S MAGAZINE." FIVE competitions of the present series are still outstanding. First is the FOUR-PART SERIAL STORY competition, announced in our December number, all MSS. for which must reach the Editor on or before May 1st. Then on June 1st both the BALLAD COMPETITION and the MUSICAL COMPETITION, announced in January, will close. In the PHOTOGRAPHIC LANDSCAPE COMPETITION FOR AMATEURS, announced in March, June 20th is the latest date for receiving entries. And the latest competition in the series is the SHORT STORY COMPETITION, in which July 3rd is the last date for receiving MSS., in accordance with the regulations published in our January number.

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A new series of prize competitions will be announced in our June number.