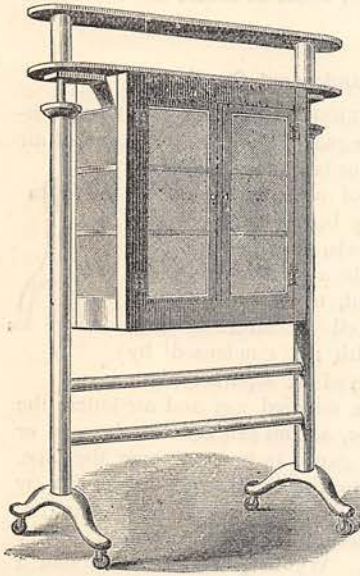


THE GATHERER.

A Suspended Meat Safe.

The engraving represents a very useful form of provision safe, which has been devised for the express



purpose of preventing beetles and other insects from gaining an entrance into the interior. It will be seen that the safe is of the ordinary construction, with sides and door of gauze or perforated metal, to allow of thorough ventilation, and to render it inaccessible to flying insects; but the top projects beyond the sides in order that it may be suspended between two upright posts.

In the upper end of the posts there is a cup for liquid, to hinder such insects as have been industrious enough to climb up the posts from ascending any farther. The cups are retained in their places by rods which pass through them and are screwed into the posts. These rods also pass upwards through the projecting top so as to keep the safe securely in position. There are special devices for preventing the escape of the liquid in the cups. It is thought to be almost impossible for insects to find their way into this safe.

A Burning Lake.

There is in Russia a fountain of naphtha which has formed a lake four miles long by over a mile wide, and two feet deep. This sheet of inflammable oil recently took fire, including the central fount, and the effect was most imposing. The quantity of naphtha on fire was estimated at $4\frac{1}{2}$ million cubic feet, and it was feared that the flames would explode the subterranean sources. Even the earth saturated with oil was on fire, but no explosion occurred. The heat was intolerable except at a distance of 1,000 yards from the edge of the fire, and the trees and buildings within three miles of it were coated with a thick layer of soot.

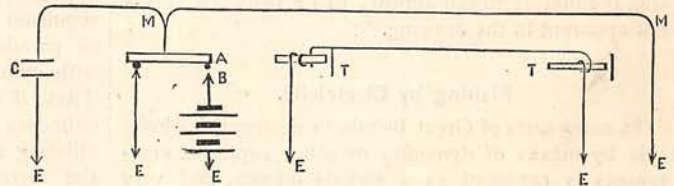
Breeding Fish at Home.

The great advantage of pisciculture is that the young fish are preserved from their enemies while

still in a helpless condition, and it is satisfactory to find this art extending in the country. At Huddersfield, Mr. Byram Littlewood has arranged a place for breeding fish for the surrounding rivers which is well worthy of attention. The premises consist of three rooms, one above another; the uppermost room containing a series of stone tanks 32 inches long by 9 inches wide and 4 inches deep, and placed one above the other like a flight of stairs. Through these tanks there is a continual supply of fresh water flowing, and being oxidised by the overflow from one tank to another. The eggs are deposited in the bottom of the tanks, like peas in a box, and sometimes three or four deep. Here they develop in peace, and ultimately, breaking their shells, take to their fins for locomotion. According to a recent writer on the subject, it is very interesting to watch the fish hatching out. Few of the fish remain still after leaving their shells, but go off rejoicing in their liberty.

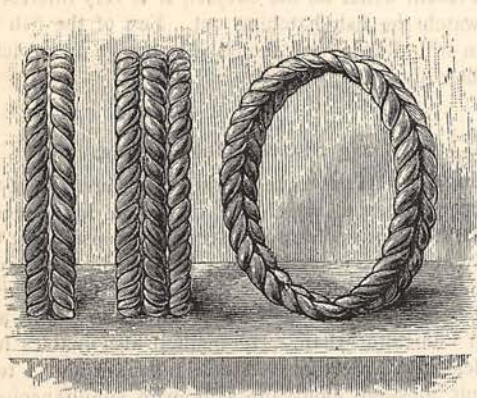
Long-distance Telephoning.

Mr. Van Rysselberghe, the ingenious inventor of the telemeteorograph, which we described in a recent GATHERER, has recently succeeded in neutralising the noisy effects of induction on telephone lines, thereby permitting the despatch of telephonic messages over long lines; for example, from Hamburg to Berlin, and from Venice to Milan. His method also enables him to despatch an ordinary Morse telegram and a telephonic message along the same wire simultaneously. In brief, it consists in graduating the rise of current in the telegraph line when a Morse signal is sent, so that the sudden induction current produced in a neighbouring wire may be obviated. This is done by causing the lever contact of the Morse signal key to throw in or out resistances of a magnitude diminishing from infinity to zero, as it is pressed down in sending a signal. Thus, in the figure, M M is the Morse or ordinary telegraphic circuit, and T T is the telephone



line running parallel to it. Now, when messages are passing over the line M M, the intermittent signal currents induce electricity in the telephone line near it, and this has the effect of disturbing the feeble telephonic currents and drowning the sounds of the latter. Inasmuch, however, as the induced currents only create noises in the telephone line when they are

sudden, Mr. Van Rysselberghe prevents them from being sudden by arranging resistance wires between the contacts A B of the signalling key, so that when the contact A is pressed upon B in making a signal by the key, the current from the battery below does not rush into the line M M at full strength, but gradually rises to its maximum. Again, when the contact between A and B is broken by the signalling clerk, there is a gradual fall of current in the line M M, and thus the induction sounds are suppressed in the telephone line. E and E are the "earth" connections of the system for completing the electric circuit of both lines through the ground. Another plan is simply to insert the coil of an electro-magnet between the key and the line. The addition of a condenser, C, joined between the middle of the key and "earth" is also found to help matters. Mr. T. Fletcher, the engineer of the London United Telephone Company, recently tested this system between Faversham and Victoria with success.



Magic Rings.

The woodcut represents three finger-rings made of gold and silver-gilt strands placed side by side. They are similar in size, and gold alternates with silver. On looking at the sides of these rings the eye is subject to a curious illusion; they seem to be much thinner below than above. This is not so apparent in the picture as on the natural object. In the three-strand ring the middle strand appears to be bent, but this is not apparent in the drawing.

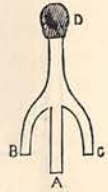
Fishing by Electricity.

In many parts of Great Britain to destroy fish wholesale by means of dynamite or other explosive compounds is regarded as a serious offence, and very rightly so; and this being the case, a new means of fishing recently introduced by a Frenchman is not likely to be considered favourably here. But as a further adaptation of electricity, which is now becoming such a wondrous power in the hands of man, the method may be worth explanation. The fishing-line consists of two insulated copper wires running side by side, and baited with an explosive cartridge

made of gunpowder, gun-cotton, or dynamite. This cartridge contains a fuse, and can be exploded by electricity at any minute by the fisherman on shore, a small portable voltaic battery being the agent by means of which he carries on the work. A likely haunt for fish having been selected, the line is dropped into the water, the fuse is fired, and immediately the floating bodies of the finny victims attest what the inventor of the system would doubtless call the success of the enterprise.

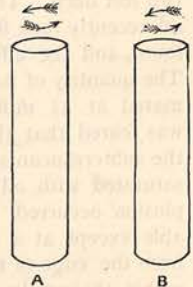
An Incandescent Gas-light.

In a recent GATHERER we described the new petroleum lamp of Dr. Regnard, in which a mixture of air and petroleum vapour is burned inside the meshes of a piece of platinum gauze. A process has recently been introduced into London by Mr. Lewis, in which ordinary coal-gas is burned in a similar way; and it is, we understand, to be tried in the parish of Clerkenwell for street-lighting. The gas mixed with air condensed by an engine is conveyed in separate pipes to the burner. The mingled gas and air enters the burner by the orifice, A, and proceeds to the cap or basket of platinum gauze, D, inverted over the pipe. Two bent draught-pipes, B C, assist the combustion by an inflow of air. The burnt gases soon heat the platinum wire red-hot, and a bright crown of mellow light is the result. We may also mention that a combination of gas and electric light has recently been patented. A strip of platinum foil passes through a gas-flame, which heats it, and the electric current at the same time traverses the foil.



A Water Analogy to the Electric Current.

Professor Bjerknæs, of Christiania, has achieved renown for his beautiful experiments showing the attraction and repulsion between little drums pulsating under water, and the analogy between them and the attractions and repulsions of magnets and electrified bodies. Quite recently he has extended his researches to the phenomena of electric currents flowing in wires; and, according to experiments before the London Physical Society, he is able to imitate the attraction or repulsion of two currents flowing in parallel wires, by means of little cylinders oscillating in water. Thus, if A and B are two such cylinders placed parallel and oscillating under water as shown by the arrows, they are found to attract one another, just as two currents flowing in the same direction along two parallel wires attract each other. On the other hand, if the direction of oscillation of one of the cylinders is reversed there is a repulsion between them, corresponding to the repulsion between two electric currents flowing in opposite directions.



Ozone and Sleep.

Some interesting experiments to test the powers of ozone as an anæsthetic have been made by Dr. C. Binz, of Bonn, in Germany. The ozone was produced by the silent discharge of electricity into the air, and when breathed along with a mixture of air it produced a drowsy state on human beings. Sleep generally ensued after seven to twenty minutes, and was usually preceded by a feeling of greater ease in breathing. The sleep was generally very deep, and was followed by a tired sensation for several minutes. The effect of the ozonised air on small animals was very marked. First they became unquiet and restless, then the breathing grew less frequent, and finally they became torpid. The restless condition of animals when "thunder," or rather electricity, is in the air will come to mind in this connection. Torpor is accompanied by a lowering of the bodily heat, irritation and inflammation of the air-passages, causing vomiting. The experiments, taken altogether, demonstrated that, though ozone is not so irritating and destructive in its effect upon delicate membranes as hitherto stated, it cannot be readily employed as an anæsthetic so as to supersede nitrous oxide.

A Golden Cave.

Near the village of Beppo-moura, in Kotchi, Japan, an auriferous cave has been discovered in which strings and nuggets of metal are openly visible in the roofs and sides. The cave has hitherto been considered sacred, and the natives would not enter it, but steps have now been taken to work the gold.

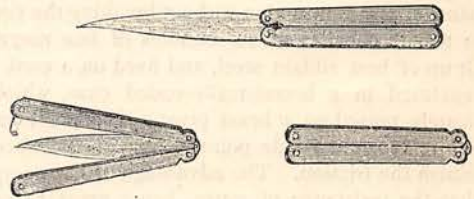
A Self-winding Clock.

In September last a new perpetual clock was erected in Brussels at the Gare du Nord, where, although exposed to wind and weather, it has kept going ever since without being touched. The winding is done by a fan placed in a chimney. The fan, revolving by the draught up the chimney, raises the clock-weight until it reaches the upper limit, when a brake stops the fan. No fire is necessary, as the natural draught is sufficient for the work. Should no chimney be available for the purpose, the inventor, M. Auguste Dardenne, states that a pipe, sixteen to twenty feet high, placed over the clock will do instead.

A Resonance Chamber Piano.

Some time ago we announced in the GATHERER that a way of seasoning pianos by means of ozone had been found. M. René, the discoverer of this process, has lately devised a resonance chamber for pianos, by which inferior instruments can acquire the fulness and strength of tone belonging to grand pianos. In place of the usual sounding-board, M. René uses a sound-chest over which the strings of the piano are stretched, and which, like the resounding body in many-stringed instruments, consists of two arched resonance-plates,

which communicate their vibrations to each other by means of bell-mouths placed between. While upon this subject we may mention that Herr J. Föhr, of Stuttgart, has invented a new apparatus termed the "electrograph," by which an extemporaneous piece of music may be recorded as it is played. The result is obtained by causing the keys to complete an electric circuit sending a current of electricity from a metal style through a travelling band of chemically prepared paper, after the manner of the "chemical telegraph." The solution is a mixture of starch, water, and iodide of potassium, and the style is of iron, so that blue stains are made on the paper when the current passes. The duration of the sounds is indicated by the length of the stains, and the positions of the bar lines are shown by depressing a pedal.



A New Knife.

Those who find the ordinary pocket-knife sometimes troublesome to open, and perhaps a trifle dangerous in shutting, will perhaps look with favour on a knife-handle recently patented. This handle is made double so as to split up lengthwise, the blade being disclosed by pulling the two halves apart and turning them round their pivoted ends until they come together again in a reversed position, where they are held by a clutch. To shut the knife the clutch is released, and the two halves swung round to their old position covering the blade.

An Electric Light Tower.

The advantage of raising a powerful electric light aloft on a high tower, so that it can illumine a considerable area beneath when its rays are shed down by a reflector, has been practically demonstrated in different parts of the country, and notably by Messrs. Siemens Brothers at the statue in King William Street, London, E.C. It is now proposed to light the shipping dock, or "levée," at New Orleans, United States, by means of towers; and the design preferred is a high iron mast, 500 feet high, and carrying at the top electric lamps of 40,000 candle power. The mast would be constructed of tubular iron pieces, and in building it the inventor, Mr. William Golding, intends to dispense with staying and the usual appliances of tower erection. In short, he proposes to raise the tower by additions made at the bottom. The top sections to which the lamps are fixed are to be put together first, and by means of an ordinary derrick

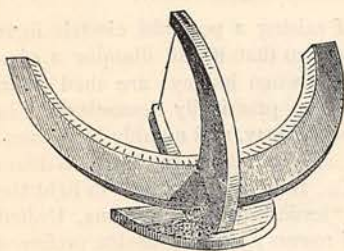
set vertically over a hydraulic press, placed upon the intended foundation of the tower. The hydraulic lift then raises the elevated sections until a new section—say five feet long—can be set underneath. When the new section has been bolted into its place, the whole is lifted another step, and so on. The tubes of the tower would be of a sufficient internal bore to allow the lamp-trimmer to ascend inside by a pneumatic lift, and Mr. Golding also proposes to utilise the erection as a look-out for fires in the city.

A Floating Compass.

A novel compass, invented by Captain Magnagni, has been introduced into the Italian navy. In it the needle floats on a pool of water, tintured with spirits of wine to prevent its freezing. The water is contained in a glass vessel, with an elastic bottom to allow its expansion and contraction without breaking the vessel. The needle consists of six bundles of fine magnets, built up of best ribbon steel, and fixed on a card. It is enclosed in a hermetically-sealed case, which is delicately poised on a brass pivot. The pivot has a sapphire top and a jade point, all highly polished to diminish the friction. The advantage of the compass is that the resistance of water, being great to rapid movements, is comparatively slight to slower ones; and hence the ordinary movements of the needle are free enough, whereas those due to sudden shocks from without are resisted, with a consequent steadying of the indications. Tried on board the *Duillio*, it is found that the discharge of a 100-ton gun, or the motion of the screw, does not affect the readings of the compass. The effects of the rolling and pitching of the vessel are also guarded against by suspending the floating case a very little above its centre of gravity.

A Chamber Sundial.

A novel sundial for use in rooms is illustrated in the figure. It is the device of M. Péraux, of Nancy, and its geometrical form comprises the straight line, the



circle, and the ellipse. To fix the true position for the dial on the window-sill of a room, it is necessary that the line of noon and the finger should be in one plane with a plumb-line, while the graduated limb or dial-plate should be parallel to the earth's equator; or in other words, the line of the finger should make an angle to the horizon equal to the latitude of the place. These adjustments done, the position of the dial is marked so that it may be set in the same place on a future occasion. Sundials are still useful, as regulators of clocks and watches, and that of M. Péraux is decidedly convenient.

Artificial Parchment.

A strong artificial parchment, impermeable by water, is, according to Messrs. Herold and Gawalowski, of Brunn, prepared in the following manner:—Woollen or cotton tissues are freed by washing from foreign substances such as gum, starch, &c., and then placed in a bath slightly charged with water-pulp; and to force the pulp into them they are passed between two rollers, which compress them. They are then steeped for a few seconds in a bath of concentrated sulphuric acid, and afterwards washed in water and ammoniacal liquor, until all trace of the acid and its base is gone. The parchment is then pressed between two steel rollers, dried between two others, covered with felt, and calendered for use.

Trains and Marsh-Fever.

Dr. King of Philadelphia, struck by the absence of malaria fever in those districts of that town and of New York where the railways run, has propounded the theory that this immunity is due to the continual passage of railway trains disturbing the air and soil. It will be interesting to note if his theory is borne out in other parts.

Animated Images.

The zootrope and the phenakistiscope of Plateau give the appearance of animation to revolving figures, but hitherto they have not been adapted to project the images on a screen so that a large audience can see them. M. Molteni has devised the apparatus, which is applicable to the lime or electric light. The apparatus consists of a pulley rotated by a handle, and communicating its motion by means of two cords to the glass disc, which is covered with a ring of images, and also to a dark shutter which has an opening or window in it. The shutter, however, revolves much faster than the image-plate. The light streaming through projects each figure of the illustrated disc in rapid succession on the screen, and the result is a changing picture which resembles a living, moving creature.

Fish Guano.

The manufacture of guano from the heads, bones, and other refuse of fishes is a growing industry in Norway. Formerly it was the custom to waste this offal, which is chiefly composed of the remains of cod-fish left after curing, but now it is dried on the hills before putrefaction sets in, and then cut into small pieces, baked on a kiln, and ground into powder by millstones. The heads and bones are ground separately, but afterwards mixed in the proportion of five sacks of head-flour to one sack of bone-flour. It contains a large percentage of fertilising materials, such as ammonia and phosphoric acid, and is in demand by the Scandinavian farmers. Herring guano is prepared in a similar way, but the salt must first be extracted from the refuse, and this is done by subjecting it to the action of steam under pressure. All the

factories for the new industry are situated in Finmark and Lofoden, where cod and herrings are plentiful.

Bleaching by Electricity.

At a recent meeting of the Chemical Society, an interesting paper on a process of bleaching by means of the electric current was read by Messrs. J. J. Dobbie and J. Hutcheson. The basis of the new process consists in generating the chlorine, which is the bleaching agent, by the electrolysis of dilute hydrochloric acid, or a chlorine salt solution. A low battery power gave the most satisfactory results in their experiments. The method consisted in passing the cloth to be bleached through sea-water between two rows of carbon rollers, the upper row being connected to one pole, and the under row to the other pole of the battery. The rollers were caused to rotate slowly and thus pass the fabric from end to end of the bath. Hypochlorite is formed, and on subsequent immersion in dilute hydrochloric acid the cloth is effectually bleached.

Tinting Hyacinths.

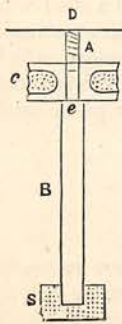
To paint the lily may be the height of folly, but to dye the hyacinth may be more justifiable, especially in the case of white ones. This, at any rate, has been done by an experimentalist, and some beautiful flowers of colours not yet produced by the gardener have been the result. The process consists in steeping white hyacinth plants in water tinged with aniline dyes, and allowing them to put forth their blossoms in it. The tintured water permeates the cells of the flowers and stains them with its colour.

Wool Velvet.

An interesting process for transforming sheepskins into an excellent imitation of velvet has been introduced by M. Puech, of Mazamet, France. Sheepskins have hitherto been used chiefly for mats and the lining of coats; but after a long series of operations, including the cleansing, tanning, and dyeing of the skins, a kind of natural velvet is the result, very pleasant to behold and comfortable to wear.

Barney's Telephone.

Mr. W. C. Barney has invented a new telephone, which gives very good results. It consists, as will be understood from the figure, of a bar of iron or steel, B, which is magnetised and fitted at one end into a solid piece of soft iron, S, while at the other it carries a bobbin, wound with silk-covered copper wire, C. In the hollow of this bobbin is a pole-piece of soft iron, to which is attached a spiral spring of iron, connecting the pole-piece, E, to the vibrating diaphragm, D, in front of the bobbin. Now the currents from the line are passed through the wire of the bobbin, and they cause the bar, B, to lengthen



and shorten according to their power. This tremor of the bar is communicated to the diaphragm by the spring, A, causing it to vibrate and reproduce the original speech.

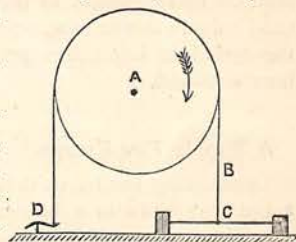
A Prolific Lily.

A remarkable specimen of the Easter Lily of Bermuda was recently transported from Jamaica to New York. It bears no less than 145 separate blossoms. The stalk is three feet high, thickly clad with long leaves, and at the top there is a perfect canopy of blossoms about two feet in diameter drooping over it on their slender stems. The flowers are trumpet-shaped and of a white and yellow colour.

Recording Sound.

In the ingenious phonograph of Mr. Edison, the vibrations of the voice are indented on a strip of tin-foil by a needle, or stylus, attached to the back of a diaphragm set into vibration by the voice. The effect is, however, comparatively feeble, and only soft yielding material will take the impressions.

According to the experiments of Mr. W. B. Cooper, recently communicated to the Franklin Institute, there is some prospect of our being able to register the voice on strong metal plates. Mr. Cooper has invented a mechanical device, which he terms a "phonodynamograph," to increase the force with which the stylus bears upon the metal sheet. This is illustrated in our figure, and consists of a pulley, A, which is surrounded by a cord, B, having one end attached to the centre of the vibrating diaphragm, C, and the other end attached to one end of a pivoted lever, D, which is shaped like a stylus and disposed so as to indent a sheet of metal passing under it when the cord is pulled upon.



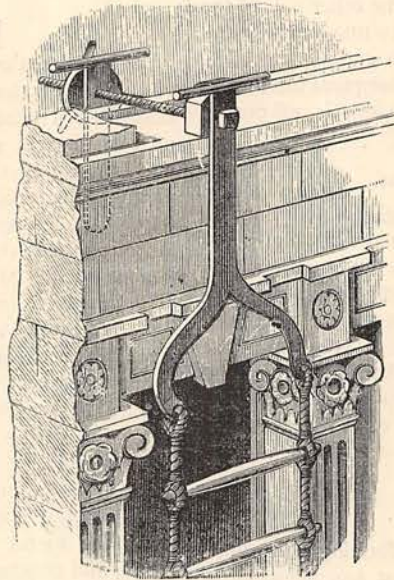
Now, when the plate, C, vibrates up and down, the cord pulls the lever, D, with a tension equal to the force with which the diaphragm vibrates, less the friction of the cord on the edge of the pulley. But if the pulley, A, is rapidly rotated in the direction of the arrow, the lever, D, is pulled upon by a force equal to the vibration of the diaphragm plus the friction of the cord and pulley. This friction grows with the speed of the pulley, and hence the feeble vibrations of the diaphragm can be made to indent with considerable thrusting power. In this way Mr. Cooper has succeeded in embossing brass as thick as a sheet of note-paper, by the impact of the voice on a phonograph plate. Thick metal sheets can be thus indented while rendered soft by heating, and the record afterwards preserved in a rigid form. Indeed Mr. Cooper's device is capable of numerous applications in the science of sound, if not also in telephony.

The Cursometer.

"Cursometer" is the name given to a small and inexpensive indicator of the speed of a train, which has been devised by M. L'Esprit, on the principle of the sand-glass. It consists of a glass tube having two bulbs blown upon its ends. These bulbs, with the intervening tube, are partially filled with fine sand, so that when the instrument is held vertically the sand will run down the tube, from the upper bulb to the lower one. This glass is mounted on a wooden case like a thermometer, and a scale of seconds is graduated on one side of the tube while a scale of kilomètres per hour is graduated on the other. To use the apparatus, the observer, holding the larger bulb lowermost, waits until the train passes a kilomètre post and then suddenly inverts it, so that the sand begins to run; at the moment the succeeding post passes, he slants the glass and stops the sand. The scale is then read off by the height of the sand column in the tube, and the speed in kilomètres per hour obtained.

A Simple Fire-Escape.

Considering the havoc that a fire may work in a house, at night time especially, it is well worth the inventor's while to devise some simple, effective, and cheap appliance for insuring the safe escape of inmates. The apparatus represented in the woodcut seems to be an effort in the right direction. It consists of a forked metal plate, to which a rope-ladder is attached, and a clamp plate for adjustment against the inside of the window-sill. The two plates are coupled together by a screw which carries a clamping wheel for readily securing the plates to the sill. When the sill slopes, a block is used in order to give the escape a level bearing. The upper end of the fork is supplied with handles to facilitate climbing out of window and stepping upon the ladder. This appliance is stated to be light, strong, and cheap. Some such apparatus is wanted, but certain features are absolutely indispensable. It must be simple in construction—that is, it must have none of that elaborate gear which generally proves "out of order" when required—strong and well adapted to its purpose, and producible



at such a price that every householder might be able to purchase one for every bed-room above the ground-floor.

An India-rubber Horse-shoe.

A horse-shoe for giving horses a good grip of the street has been devised by Herr Schneider, of Berlin. The calks or studs are of caoutchouc instead of iron, and they are fitted into pockets cast into the rim of the shoe, which is of malleable cast iron. They are fixed in the pockets by means of rods crossing below the hoof of the horse and bolted exteriorly. For horses with heavy loads to draw, leather may be substituted for india-rubber, and in time of frost a short screw calk may be added to the front of the shoe.

A Talking Canary.

The imitative powers of parrots and starlings are well known, but it is seldom that the canary develops this faculty of speech to such a degree as is the case with a little songster belonging to Dr. J. McGrigor Croft. This canary not only warbles very beautifully, but speaks words and sentences with great distinctness.

An Iron-Tree.

The "palmetto" is the emblem of South Carolina, which indeed is poetically called the "Palmetto State." During the American Civil War, South Carolina played an important part, and quite recently a memorial to the soldiers who fell in its defence was erected in front of the State House. It took the form of a wrought-iron palmetto-tree, every leaf of which is exquisitely worked, and so delicately poised as to tremble in the breeze.

An Endless Stone Saw.

An endless "band" saw for cutting stone has been invented by Mr. P. Gray. It consists of a steel wire rope passing over two pulleys, and besides its rapid forward motion it has a twisting movement, which clears out the groove cut in the stone. The saw can do twenty times the work of a hand-saw in the same period of time.

DOMESTIC TRAINING FOR GIRLS.

Competitors for the Prize of Five Pounds offered for the best Essay on the above subject are reminded that the Competition closes on September 1, 1882. The rules of the Competition, which must be strictly observed, were published in the June Part of the Magazine.