

marguerites, and very effective they prove on the satin of the "crushed raspberry" shade.

Plush collars, plush hoods, and plush fichus trimmed with lace can be worn with any of these dresses. They add considerably to the smartness of a toilette, for plush, with its long silky fleece and colourful reflets,

always proves becoming. Pale shades of Indian gauze, gold, silver, and silk embroidery are added to these plush accessories, which are also sometimes painted in oils, as are plush muffs. A point to be remembered in these painted trifles is, that the design selected should be small flowers of graceful growth.

BUT PARTLY READ.

I OPENED once some quaint romance,
And reading, fast the moments flew ;
But, hindered by some trifling chance,
I failed to read the volume through.

And now 'tis years ago, and life
Seems long as I that time recall ;
I know it was some tale of strife,
And lives were made to climb and fall.

I still remember with what zest
I read, and guessed the secret part ;
And now would like to learn the rest,
But greater wonders move my heart.

Oh, friends of yore ! oh, sacred band !
Forsaken, scattered, changed and dead,
How, in my lonely heart, ye stand
Like tales of youth but partly read !

WILFRED WOOLLAM.

THE GATHERER.

Cleaning White Silk Lace.

A German contemporary gives the following plan for cleaning white silk lace :—The lace is first sewn over small clean slips of wood to keep it evenly spread out. It is then laid over-night in warm milk to which a little soap has been added ; afterwards rinsed in fresh water, then laid for the same length of time in warm soap-lye, and finally rinsed again, without any friction. If an additional bleaching is still required, put the lace while yet in its damp state in the rays of the sun.

Linen lace can be beautifully cleaned by covering the outside of a large glass bottle smoothly with stout linen or white flannel, upon which the lace is sewn in a number of coils or turns, and over the whole some coarse open tissue is secured. The bottle thus clothed is allowed to soak for a time in lukewarm soft water, and the outside wrapping is then rubbed with soap and a piece of flannel. When this has been done the bottle is to be laid a-steep for several hours in clean soft water. It is then to be rolled between dry towels, dipped in rice-water, and rolled again. Finally the damp lace should be unfastened from the bottle and ironed at once between linen cloths.

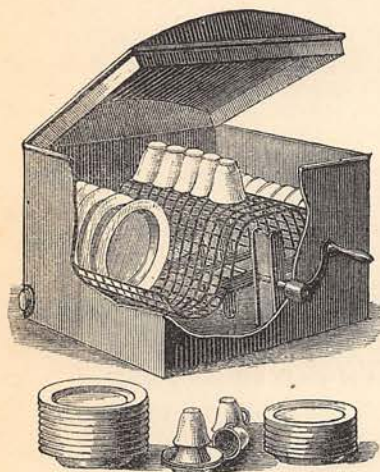
Phosphated Flour.

The wheat-grain, as is well known, consists of an outer skin or bark, and an inner kernel of starch, separated by a shell of gluten. Now this is the most nutritious portion of the grain, and contains the phosphates and nitrogenous matters, which are the best food for the brain and tissues of the body. It is, therefore, a great pity that so much of it should be

pared away from the wheat in the ordinary process of milling and sifting, and turned into bran and "middlings," for the use of cattle, instead of being left to enrich the fine wheat flour of which our bread is made. In raising bread, too, by the use of barm, in order to make it more porous, and absorptive of the digestive juices, a considerable proportion of the gluten remaining in the flour is decomposed during fermentation. It would therefore be another gain if a means could be found of raising the bread without the use of a yeast or leaven which preys upon the gluten, in order to form the carbonic acid gas necessary to raise the dough. From time to time attempts have been made to remedy these two defects. "Whole meal" bread, or bread made of unsifted flour, has been tried instead of white flour, but it is subject to the drawback that the bran in it tends to irritate the bowels. Again, Dr. Daughlish's method of raising bread by kneading into the dough a solution of carbonic acid gas in water produces an excellent light bread. A new process brought to our notice is, however, designed to remedy both defects at once, and produce a self-raising bread having all the nutritious salts restored without the intermixture of bran. This end is attained by adding to the flour, before it is sent from the mill, the proper proportion of phosphates which have been removed with the bran, and which, when moistened in the ordinary process of making dough, give off the carbonic acid necessary to raise the bread. Any kind of flour is thus rendered as nourishing as "whole meal," and yet retains its tempting whiteness, while bread and pastry made from it have been highly recommended for their wholesomeness.

A Machine for Washing Dishes.

Of all the unpromising themes for the cogitation of those of an inventive turn of mind, we should have thought that an appliance for washing dishes would offer the smallest attraction, if indeed it were not altogether impracticable. Yet such an opinion would have been erroneous, for an apparatus of this kind has actually been patented. It consists of a shaft carrying paddles, which revolves in a box-shaped vessel of tin or galvanised iron, a curved grating being



placed over the shaft to support the dishes that are to be washed. Cups and other hollow articles are laid above the shaft, flat dishes on either side of it. The paddles are provided with flanges in order to make them throw up more water and with greater force than if they were plain, while the shaft is turned by means of a crank. The vessel being partly filled with water, to which a little soap has been added, the shaft is vigorously turned to right and left for a few moments, when the lid of the vessel is taken off and the dishes are rinsed by pouring some water over them. The dishes are then thoroughly washed, without breakage or chipping, and with a very small amount of labour. The inventor claims that this novel dish-washer will cleanse as many dishes in five minutes as one person will clean in an hour in the usual way, and that therefore its use in hotels, restaurants, and families whose household arrangements are conducted on a large scale, is recommended in respect of its saving of time and its tenderness towards crockery and china.

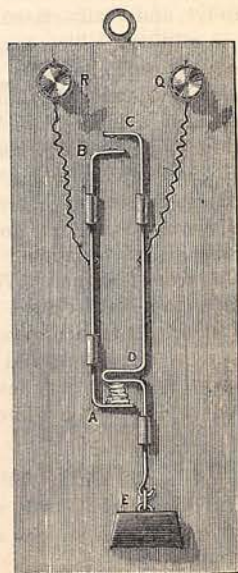
An Electric Lift.

To Dr. Werner Siemens is due the credit of first successfully applying the powerful electric currents generated by the modern dynamo-electric machine, for electric lighting, to the propulsion of carriages along a railway; and we have now to record his successful employment of the same power to hoist the cage or carriage of an elevator. The electric railway is now being constructed between Berlin and one of its suburbs, and the electric lift has been in operation of late at the Mannheim Industrial Exhibition, where, in the course of a few weeks, it raised over 8,000 people to a height of nearly 100 feet at a speed of one and a half feet per second. The cage is suspended in the shaft by two wire ropes, which pass over two

pulleys at the top of the shaft, and carry at their other ends two counter-weights which balance the average weight of the loaded cage. By this arrangement, only a little extra electric power is required to move the cage up and down the shaft. This power is supplied by a dynamo-electric generator stationed on the ground, and it is conducted from the generator to a second dynamo-electric machine attached to the cage. Its action is to rotate the armature of this second machine, and this rotation is communicated by means of an endless screw on the axle of the armature to a pair of toothed wheels also attached to the cage. These toothed wheels gear into a kind of rack or ladder, which runs up the middle of the shaft through a hole in the centre of the cage, and as they revolve they climb the ladder and force the cage upward. The conductors for the current are led along this ladder and the current is tapped from them by two metal rollers which make contact with them. By means of a handle working a "commutator" the current is made or broken, or reversed, and the cage is hoisted upward, stopped, or lowered to the ground. For large hotels and boarding-houses, if not for stores or warehouses, the electric lift is likely to prove exceedingly useful.

An Electrical Fire Tell-tale.

The rise of temperature which accompanies the outbreak of a fire in a particular part of a building, is in several ways made to ring an electric alarm bell. One of these is to have a mercurial thermometer in the room, so arranged that when the mercury column rises to a certain critical degree it will make contact between two platinum wires sealed into the tube, and thereby complete the electric circuit and ring the bell. The figure illustrates a still more simple plan; it consists of two bent metal stems, A B and C D, which are put into connection, by means of the terminals Q R, with a voltaic battery and an electric alarm bell. At B and C two platinum contact studs are shown on the stems, and these are kept apart by a piece of common suet or tallow placed between the stems at their lower parts, A D. When the temperature of the room increases so much as to melt the tallow, the stem C D is pulled down by the small weight E, and the contact stud on C makes contact with the stud on B, thereby completing the electric circuit, sending the battery current through the bell, and sounding an alarm. For factories this plan may be useful on account of its simplicity, but the presence of grease quite unfits it for a room.





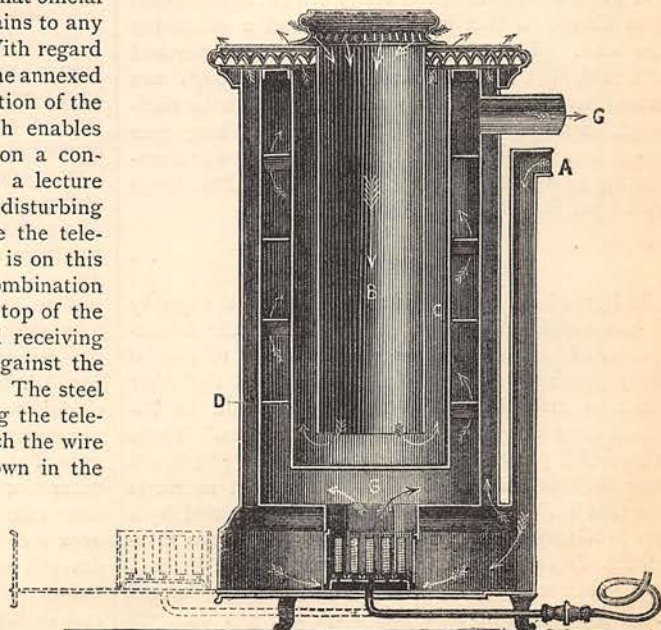
Alarm Telephones.

It is proposed to add the telephone to the fire telegraphs of Chicago, in order that the character and true place of a fire may be communicated to the nearest fire station, or the particulars of a burglary or other crime committed may be delivered at the police office. The suggestion is a valuable one, and shows how in a great city the telephone may aid the cause of public law and order. In the case of a riot, it is intended to have a reserve force and ambulances at the telephone stations all ready to start when the alarm is given; and should a serious crime be perpetrated, an alarm bell is to be rung from the station-roof to warn every policeman on his beat. In our own country, the Leeds Water-works and Fire Brigade committees are, we understand, about to adopt the telephone between the town hall police station and the turn-cock's residence at the water-works, in order to enable that official to regulate the pressure of water in the mains to any part of the town where a fire breaks out. With regard to the improvement of the telephone itself, the annexed engraving shows a very convenient combination of the transmitting and receiving telephones, which enables a person to repose in his chair and carry on a conversation with a distant friend, or listen to a lecture delivered in a neighbouring hall, without disturbing himself. It is, of course, American, where the telephonic service is far more advanced than it is on this side of the Atlantic. As will be seen, the combination is effected by a steel loop placed over the top of the head and carrying two semi-spherical Bell receiving telephones at its ends. These it presses against the ears, thus excluding all extraneous sounds. The steel spring is magnetised and its ends carrying the telephones are therefore magnetic poles, on which the wire coils of the telephones are mounted, as shown in the right-hand telephone. The Edison transmitting telephone which the person speaks into is hung from the other two by an elastic yoke, and adjusted to fit over the mouth. Flexible conducting wires, of course, lead to the telephone line,

which in turn is connected with the other party in the conversation.

Adams' Gas Stove.

The new gas stoves of Dr. Adams, of Glasgow, as exhibited recently at the Glasgow Exhibition of Gas and Electric Lighting Apparatus, have attracted a great deal of notice. They are of two sorts, for heating and for cooking; and both kinds are constructed on strictly scientific principles, which is more than can be said for many other stoves, wherein appearances seem to have been the first object of the designer. The heating stoves are admirably adapted for dwelling-houses, offices, churches, and conservatories. Not only do they distribute heat by direct radiation from their surfaces, but they also give off a supply of pure warm air, and this air may either be diffused from them in a dry state or artificially moistened, an arrangement which eminently fits them for the rooms of invalids or the wards of hospitals. Moreover, the quantity of warm air given off may be modified at pleasure, or stopped altogether. The better to radiate the heat, a plain iron outside, devoid of any fanciful ornamentation, is adopted. The accompanying illustration shows a section of one form of stove suitable for house apartments, school-rooms, warehouses, conservatories, &c. The gas is let to the burners by the gas-pipe seen below. These burners are cylinders of plumbago, which become red-hot and make a kind of fire in the bottom of the stove; and the heated air and gases which they give off do not pass up a single smooth flue, as is ordinarily the case in gas stoves, but circulate through a series of cells, enclosing the chamber of pure air to be warmed. In the figure this hot gaseous current is shown by *forked* arrows traversing the series of chambers with their contracted openings, and



finally making their exit by the chimney G. The course of the pure air which enters the stove from above to be warmed is indicated by the feathered arrows. It first passes down the wide central tube B, then up the narrower middle tube C, escaping by the outlet holes in the top of the stove. This is the main stream, but another outer stream enters by the pipe A, at the back of the stove, and after being warmed in a chamber surrounding the fire, passes upward by the outer shell of the stove D, and escapes also at the top. The dotted lines at the base of the engraving represent the arrangement for preventing explosions. When it is desired to light the stove, the whole furnace is drawn out of its chamber on a sliding tray or drawer, and until that is done the gas cannot issue from the burners. Moreover, the act of drawing out the furnace permits a large supply of fresh air to enter the furnace chamber; so that the gas-jets can only be ignited openly in the unconfined air of the apartment, where it is no more liable to explosion than an ordinary gaselier. One practical result of Dr. Adams' arrangement is that the heating power of the stove can be accurately raised or lowered by simply raising or lowering the gas-jets, so that the temperature of a room can be promptly regulated. In the cooking stoves of his invention external radiation is prevented by coating the outer casing with a metallic alloy, incorporated with the substance of the case by an electro-chemical process, and Dr. Adams affirms that from four to twelve times more heat escapes from the ordinary cast-iron exteriors than from his metal skins. As there is no chance of contamination with the heated gases, the viands being cooked in these stoves retain all their natural delicacy of flavour.

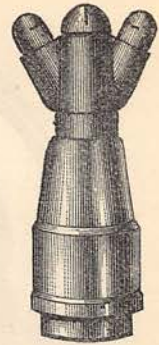
A New Vine.

A French explorer in the valley of the Niger reports from Koundian that he has discovered a promising new vine. The root of this vine is tuberose and perennial, but its branches singularly enough are annual, and die down every autumn. It can be cultivated, he says, as easily as the dahlia. The grapes are plemteous and excellent, and in order to acclimatise the new fruit in Europe both seeds and seedlings have been sent to France for cultivation.

The Focus Gas-burner.

It is, we believe, a melancholy fact that the quality of gas supplied by some companies to the householders of London is considerably inferior to that of many provincial towns; but there can, on the other hand, be little doubt that more light could be obtained from it by the use of better burners. There are several patent burners in use, most of which will bear out this statement. Among the most recent is one that hails from New York. It is invented by a Dr. McGeorge, and has been styled the Focus Gas-burner. In this burner, two small side jets are directed to a point at the base of the flame, throwing heated gas mixed with air; in this way, the gas becomes more expanded and rarefied, while a greater amount of

oxygen is carried to the flame. The blue portion of the flame is reduced, so as to extract from it the utmost degree of illumination, and the more thorough combustion likewise checks the out-flow of carbonic acid gas. Since gas admits of almost unlimited expansion by heat, the more the particles are heated and separated, the more perfect is the combustion, and the greater the production of light. By means of a regulator, enough pressure is maintained to secure complete combustion in this burner. Testing the "Focus" with a common burner under the same pressure, and with the same quantity of gas, the former was found to yield twice as powerful a light as the latter.



Blacking Boots by Machinery.

"'Chine your boots, sir," will, by the change of a single letter, easily adapt the present cater-cry to that which would become necessary in the—probably remote—event of the shoe-blacking machine being employed by those who, for a consideration, are willing to "polish" the boots of the public. The machine in question is the invention of an ingenious Frenchman. Its details are, as might be expected, few and simple, comprising mainly a series of circular brushes for cleaning the boot, applying the blacking, and polishing—the motive power for the same being supplied by a treadle that imparts the requisite rotary motion. The chief point in connection with the machine has reference particularly to the method of applying blacking to the brush specially devoted to that humble but most useful substance.

Best Form for Lightning Conductors.

What is the best form for a lightning-rod, has long been a moot question among electricians. Some have maintained that it should have as much surface as possible, because the electric discharge travels along the surface either wholly or in part at least, while others have argued that the sectional area of the conductor is the dimension to be attended to. The result has been that lightning-rods for ships and buildings take divers forms, some makers preferring flat strips or hollow tubes, in order to give a large surface, and others adopting simple cylindrical rods or wire ropes, in the belief that *mass*, not *surface*, was the essential requirement. Recent experiments of Mr. W. H. Preece, the Post-Office electrician, have evidently proved that extent of surface in the rods does not favour lightning discharge, and that with copper rods of the same conductive power for electricity the mass of copper employed is the important point. No more efficient lightning conductor than a cylindrical rod or a wire rope can, in the opinion of Mr. Preece, be devised, and the thicker the diameter of the rod the better. Evidently a wire rope is preferable to a solid rod, on the score of its being less liable to break across by a blow.

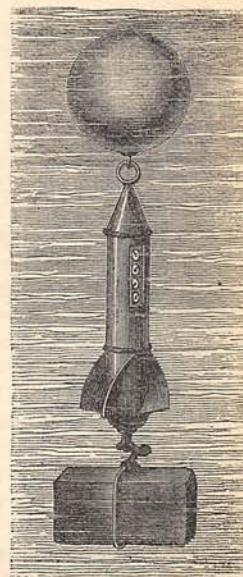
In connection with this subject, a very useful rule for placing lightning-rods may be drawn from the following relation between their height and the space they protect, which has been arrived at by Mr. Preece, who finds that a rod protects a conical space around, whose height is the length of the rod, and whose base is a circle of radius equal to the height of the rod. The side of this volume is a quadrant of a circle whose radius is equal to the height of the rod. Mr. Preece has never been able to discover any instance of lightning-struck houses in which damage was done within such a cone. The theorem shows, however, that every prominent point of a building should have its own lightning discharger or set of points, unless such point comes within the protected area, and that every turret of a church tower should have its own discharging points.

A Pneumatic "Cash."

Shopping is a tiresome business, and one great drawback to the comfort of our large "stores" and warehouses is the necessity of going to the cashier's box to pay for the purchases made. The system of "cash" boys or girls who perform this duty and return with the change is far pleasanter for the customer, since it enables him or her to remain quietly seated at the counter. But the drawback to this antiquated plan is its noisiness, and the incessant calls for "cash," attended by the hurrying of that functionary to the scene of action, are, to say the least of it, annoying. A remedy for both of these imperfect systems has, however, just cropped up in America—that land of time and worry saving novelties—and we hope it will soon be introduced into the great retail establishments of London. Cash boys and girls have been replaced by a system of pneumatic tubes, such as carry letters and telegrams from the central telegraph station at St. Martin's-le-Grand to the numerous local post-offices in the metropolis. Each counter in the shop is connected to the central box of the cashier by two pneumatic tubes, one to carry the account and money paid in, and the other to take back the proper change and the receipt. An inspector attends at every counter and works the tube, receiving the money from the customer and giving back the change, and this is effected while the person who acts as "wrapper" for the counter in question is wrapping up the goods. The "carriers," which dart along inside the tubes under the pressure of the air, are little cylindrical boxes of steel, lined inside with green baize, and fended at each end by felt cushions. Each carrier is of the exact diameter of a silver dollar, and is capable of holding thirty dollars. By means of a steam-engine and an exhaust-pump in the cellar, the air is constantly being exhausted at the delivering ends of the tubes, so that whenever the carrier is loaded into the mouth of a tube it is immediately sucked to the other end, where it is delivered automatically by a special device. Not only are time and noise saved by this ingenious arrangement, but the ventilation of the ware-rooms is improved by the continual supply of fresh air which is discharged into them.

A New Deep-Sea Sounding Apparatus.

It is only within recent years that the secrets of the deep sea have been investigated in anything like a thorough manner, but the researches of Sir Wyville Thomson, Mr. Carpenter, Mr. Moseley, and others, encourage us to hope that much will yet be done in what is, comparatively speaking, a new field of scientific work. Meanwhile the little instrument figured in the woodcut may be taken as some slight evidence of the growing interest in deep-sea exploration. It is the invention of M. Paul Rousset, of St. Petersburg, who claims that its use renders a sounding-line unnecessary, and insures more accurate



soundings than can be obtained by the usual means. It consists of a sinker that is joined by a sort of hook-and-eye attachment to an ordinary registering log, the log being in turn fastened to a buoy of capacity sufficient to raise it after the separation of the sinker. The registering mechanism is prevented, by a special device, from acting during the lowering of the log, but it operates as soon as the log ascends. The movement of the sinker is simple. So long as it is unimpeded in its descent it hangs suspended to the log, but whenever it touches the bottom the hook falls out of the eye, and the log being freed from its counterbalancing weight is at once carried to the surface by the buoy, the screw in the lower part of the log in the meantime actuating the mechanism by which the distance through which the log passes is recorded.

A Protective Dress for Firemen.

Several years ago Herr Oestberg, a Swede, invented a protective felt dress for firemen, kept wet by water supplied to it by a tube, but it failed in practice owing to the fact that the water had to be conveyed to it in this way. Recently Mr. August Beyer, of New York, designed a suit which is more practicable. It is made of a thick woollen fabric coated with a compound of red ochre, glue, and sulphur, and is lined with oil-cloth, while between these cloths there is a layer of compressed wool impregnated with coal-dust or such-like material. The metal helmet has a bull's-eye lens in front for the fireman to see by, and underneath it a flexible tube or proboscis hangs down, with a packing of wet sponge inside to cool the air and filter it of smoke before it is breathed. The proboscis is kept expanded by a spiral spring within it, and the bottom is closed with a perforated plate. The jacket is connected to the helmet by means of a collar. The outer coating of the dress is fire and water proof, but as it blisters under the heat it has to be renewed after every exposure.

A Glass Window Blind.

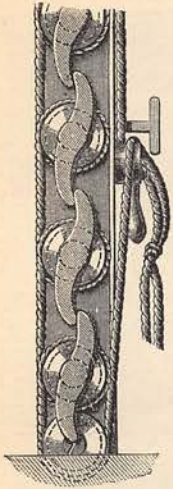


FIG. 1.

A novel window blind, which comes to us from America, is illustrated in the two accompanying figures. The movable bars or slats of the blind are made of glass, either milky-white or coloured to any tint, and they are made of various forms and sizes. The slats have no rods or bands to operate them and interfere with the entrance of the light; each is fitted at its ends with a small pulley, round which the cord passes, which opens or closes them all simultaneously. The blind admits of good ventilation and excludes flies and mosquitoes, besides forming an additional impediment to burglars. Owing to the fact that the slats can be engraved with tracery, or tinted to any required shade in harmony with the furniture of the room, these blinds can be made an adornment to a room, and as they require no fresh painting and are easily kept

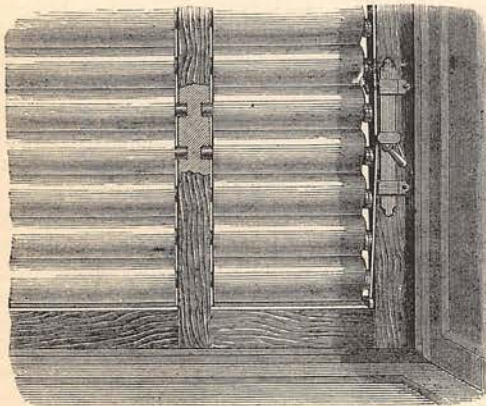


FIG. 2.

clean, they must be considered an improvement on the ordinary Venetian blind. Fig. 1 is a section through the slats, showing the shifting pulleys; and Fig. 2 gives a front view of the corner of a blinded window.

Flexible Rail Joints.

Joints in rails were at first not so strong as the solid rail, but latterly they have been strengthened by the "fish-plates" at the expense of their flexibility, and though the ordinary joint is now as strong, it is more rigid than the rail, and therefore tends to cause uneasy travelling. To remedy this defect Colonel Richard Long, of Chicago, has designed a fish-plate which increases in thickness from its ends to its centre. The result is that there is no sudden accession of rigidity at the ends where the plate is bolted to the solid rail, for the plate there is thin, while at the middle point, where the break between the two rails occurs, the fish-plates are thickest and most

rigid. In America, where comfortable locomotion is so much sought after, these joints are being rapidly introduced.

A New Forage Plant.

"Deschugara" is the name of a new forage plant largely cultivated in Turkestan and some parts of Russia. According to Mr. Christy, it is a *Sorghum*, closely allied to the Dhurra grass of India. It has a tall stout stem, and is readily devoured by cattle either in the green state or as straw. The grain resembles oats and barley, and is ground into flour for human consumption or given whole to animals. One variety ripens in three months after being sown, and yields a thirty-fold return, 100 lbs. of seed producing about 3,000 lbs. of garnered grain.

"A Simple Spy-glass."

A correspondent writes:—"My attention having been called to the November issue (No. 72) of CASSELL'S FAMILY MAGAZINE, wherein is described 'A Simple Spy-glass,' claimed to be the invention of Herr T. Geiger, Stuttgart, I think the accompanying blue book, containing my specification and drawings filed at the Patent Office in April, 1875, will convince you of the fallacy of Herr T. Geiger's pretensions.—W. LUCE HOSKING." We have little doubt that this is a coincidence, and that Herr Geiger had no idea of the previous existence of Mr. Hosking's invention.

Prize Double Acrostics.

V.

A Scottish gulf; a German river;
A fight to be remembered ever;
A hill whose sides once streamed with blood
When Israel poured down like a flood;
A king who sat on England's throne,
And took a title erst unknown:—
In their initials there shall be
A name or armet of the sea;
The fina's too, which you descry,
Shall yet another name supply.

VI.

Five lovely young maidens went walking one day,
And beguiled with their laughter the length of the way,
The first one assuming the air and the dress,
The grace and the name of an Eastern princess;
The second—a part of whose name may be seen
In that of a stern, bellicose British queen—
Fell into the far-spreading toils of a net
That had, in a frolic, been purposely set;
The third paused to pick a sweet flower in the dell,
And to list to the far-distant chimes of a bell;
Whilst the fourth, drinking in the delights of the scene,
Warbled gaily the strain of "The Young Adeline;"
And the fifth told the tale of her namesake of Greece
As oft as the soul-stirring music doth cease.

No doubt, lads and lasses, and old men and dames,
You will find out these maidens, and what were their names;
Their initials and finals, if all rightly cast,
Will aid you by giving the first and the last.

W. M. A.

PRIZE SOLUTIONS TO ACROSTICS.

We shall now be happy to receive the solutions in verse of the whole set of six Prize Acrostics, under the conditions named on page 64 (December Part). No solutions will be received after March 31, 1881.