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# CANADIAN MECHANICS' MAGAZINE AND PATENT OFFICE RECORD

Vol. 5. MARCH, 1877. No. 3.


## CANADIAN INVENTIONS.

LABOUR SAVING MACHINES BEGET WEALTH TO A COUNTRY.

WE opened the January number of this MAGAZINE, for the present year, with a leading article on the influence the late Centennial Exposition of the United States would have upon our own country, and at the same time promised occasionally to return to the subject. That the exhibit made by Canada had a great effect upon English manufacturers, and such foreigners who visited the Exposition, we have every day convincing proofs from reading articles that appear frequently in many Trade Circulars and Scientific papers; not exactly so much in praise, as in the tone of alarm expressed that this country, like the United States, will soon become, if not already, a rival to their trade in the manufacturing of certain staple articles. Even now we are underselling English manufacturers in the trade of boots and shoes, in those towns where they have hitherto held unrivalled sway.

The population of the Dominion of Canada being a mixed race, is well suited for carrying on to advantage many kinds of manufactures, more so, in fact, than if its inhabitants consisted of one race only. French Canadians, both male and female, are particularly well adapted to work in manufactories where the labor is not too heavy, and they readily pick up any business they are put to. We have, therefore, a large population in the Province of Quebec that can always be profitably employed in manufacturing boots and shoes, furniture, and woodwork generally. The inhabitants of the Province of Ontario consist of a great number of sturdy, cautious Scotchmen who are well adapted for their favorite occupation of farming, and judging from the increasing demand in England for fresh meat from America, fruits and other produce, and the ascertained fact that fresh meat can be exported to England with a certainty of profit, a fine field is now opened for agricultural enterprise. The people of New Brunswick, Nova Scotia, and Prince Edward's Island have, in addition to many of the advantages which other parts of the Dominion possess, their coal mines, and extensive marine front, which can be turned into great wealth; whilst even the inhabitants of Newfoundland, who are unengaged in fishing, might have their spare time, during long winters, profitably employed in manufacturing many staple articles of more or less value. British Columbia, and Manitoba also, although but infant colonies, will no doubt find many sources from which wealth can be extracted.

The reader at this point may say: We are well aware that we possess all these advantages, that our population, of mixed races, is well suited for manufacturing and farming, and that we possess all the crude elements of wealth in rich mineral deposits and our forests trees, but how are we to turn these into gold, in the face of restrictive tariffs; how are we to compete with the United States, alone, and against their heavy protective duties?

We answer this question by asking, how is it that the manufacturers in the United States, more heavily taxed, paying higher for material and labour than ourselves, are able so successfully to compete in the English markets with Home manufacturers? How is it that they send their goods to all parts of Europe, China, Japan and other parts of the world and make it profitable? Have they any greater advantages in trading with the world at large, in the same commodities that we could supply, except in their open winter—have we not less taxes on our manufactures, cheaper labour and less costly raw material? Then why is it that they possess greater advantages? Why is it that their manufacturers can actually buy our lumber, pay a duty of twenty per cent for its importation to the States, and freight besides, manufacture it into furniture and other kinds of woodwork, pay a higher price for labour to make it up, and then send it back to Canada manufactured, after paying more freight and 17½ per cent. duty on the manufactured goods, and still be able to undersell the manufacturers of the same class of goods in our own country? This statement our makers of furniture must concede to be true. There is no use in shutting our eyes to this hard fact, or setting down bad times as a cause for American manufacturers

selling at reduced prices in the Canada market—and that they are, in consequence, sacrificing their goods, for it is well known that they did so ten years ago, when money, after the war, was plentiful, trade brisk, and labour and materials high. How then, under such unfavourable circumstances, do they manage to sell a superior article to what we manufacture and at a lower price? We answer from the *perfection of their machinery* and from the numerous *inventions and contrivances for labour saving*, used in their factories and workshops, which enables them to turn out better work, and in less than half the time that we take to do the same. These labour-saving contrivances not only economise time, but the machinery is made so perfect and true that they are enabled to utilize every piece of wood, and scarcely any goes to waste; whilst we throw enough of it away to pay in itself a profit; therefore, until our manufacturers cease to jog on in the old fashioned way, and with old fashioned machinery, the field for the sale of manufactured goods, which are particularly adapted to our population, will be held by the United States, although we possess labour and the raw material at rates altogether in our favour.

We of course speak in a general sense; there are some exceptions to this rule, and where these are to be found, success has been very marked. The intelligent and enterprising shoe manufacturers of Montreal and Quebec—are a striking example of what energy and enterprise can do for a country.

A warning has appeared in an English paper, the *Northampton Mercury**—from a correspondent on his side of the water—in relation to the boot and shoe trade:

"While you shoemaking chaps over the sea in Northampton are squabbling and fighting, the Yankees are taking your trade away. Eastern men have had consultations and meetings about the best means of obtaining (with a strong view to keeping) the whole South American trade. Men have been sent down to Brazilian ports, to Buenos Ayres, to prospect; sample cases of goods are now travelling after their heels, at figures that would make Northampton manufacturers' hair stand on end, and good shoes at that; and I guess I can tell a good shoe from a mud turtle, or a bad one from a flap-jack, as well as any other unsainted Crispin. The goods are not as nice shoes for the market as I have seen sent to the same destination from Northampton—not as nicely fancy-stitched as Northampton 'gals' can stitch 'em; still, they are well fitted, well bottomed (both cable screw and machine sewn), well finished, and good stock to boot, and at very low figures. Another set of these uneasy Massachusetts 'Yanks' have sent samples of boots, kip split and calf, good kip boots, pegged and cable screw, and brogans (blutchers) to German and Austrian commission agents, for them to try and bring the European army trade this side the Atlantic. How is it done? Well, we had a panic that you know we haven't got over yet; and we have so much machinery here—machinery *to crimp the stiffenings to shape of last*, machinery to *last*, machinery to *block out sole shape*, machinery to *rivet* (cable screw successfully, too), *and* machinery *to trim* (*this too is a success*) *heels and forepartes*, machinery *to burnish* (*ball off*), machinery to *buff and sandpaper*, and finally put on the firm's *coat of arms* and *motto, legend*, or whatever they illustrate the shoe bottom with by way of trade-mark. All this powerful use of the 'machine' is steam-driven in a hundred factories in this land. We don't break windows here whenever a new machine is put up in the factory, and we have as many lean, hungry-ribbed shoemakers here as you have at Northampton; lots of 'em ready to work that machinery, whether it be upon orders by the thousand, the hundred thousand, or the million."

The *Leather Trade Circular and Review*, in commenting on this article, has the following:

One result of the Philadelphia Exhibition has been to impart to the more intelligent class of employers and employed in this country some idea of the enormous extent to which labour-saving contrivances are used in the factories and workshops of the United States. A considerable portion of the boot and shoe manufacturing machinery with which English operatives are now familiar was known to Transatlantic Crispins long before it had found its way into this country, and even now, if we may trust the assertions of recent visitors to America, we are far from being acquainted with all the improvements by means of which, rather than by the protection system, which is everywhere regarded as doomed, the shoe manufacturers of the United States hope to defy European rivalry. This is not at all unlikely, but it is prudent on the part of English manufacturers that such ignorance in matters so directly affecting their interests should be possible! In the great industrial competition we are somewhat unfairly handicapped; our American rivals are kept well-informed respecting every mechanical invention or improvement introduced here; but we are not in such a state of enlightenment respecting their doings. If our various trades unions had the interests of their members really at heart, they would expend a portion of the funds at their command in obtaining information of such vital importance, instead of wasting them in fermenting disastrous quarrels between masters and men. There can be no question that, with a revival of trade, the force of American competition in foreign markets will be felt more keenly than at any previous period, and we ought to be prepared to hold our own.

Whether the writer be a Yankee or not, there is plenty of sound, sober truth in what he says, and the members of the English leather trades would do well to carefully ponder on the unsolicited advice thus boldly, but apparently sincerely, proffered them.

The alertness of the United States boot and shoe firms to carry their manufactures into England, is expressed in the above article in quite a tone of alarm. We believe, however, that the Canadian shoe manufacturers were the first in the English market with their goods. But the writer to the *Northampton Mercury* seemed to fear competition to English manufactures from the United States alone, and supposed that nearly all those valuable machines and new inventions, to which he alludes, were the offspring of Yankee brains. We have much pleasure, however, to be able to state the contrary. The most important of the machines alluded to were invented by a CANADIAN, MR. LOUIS COTÉ, of St. Hyacinthe; and, as an act of justness to Mr. Côté, we consider it our duty to make the same known in the columns of the CANADIAN MECHANICS' MAGAZINE, and as an encouragement to his countrymen to use their inventive faculties (in which they are as fruitful as Americans) to improvements and perfection of machinery, and thus while realizing, perhaps, a fortune to themselves, benefitting thousands of their fellow-countrymen by new forms of employment.

The success of our Canadian shoe manufacturers is an example to our manufactures of other goods (better favored than the shoe trade) of what enterprise and energy can do; take, for another instance, the improvements made last fall in the manufacture of rubbers by the Quebec Rubber Co., since it has fallen into more energetic hands; their rubbers are now quite equal to American and up to the times. The fact is that unless some of our manufacturers give over their old fogeism, they can no longer hold their own against more enterprising and intelligent firms. The shoe manufacturers of Canada are now carrying the war of competition into the very centre of the largest manufacturing country in the world, why cannot others do the same in their own lines of business, in which they have greater advantages?

We have in the foregoing correspondence a striking acknowledgment of what machinery can do to create wealth and employment in a country, which enables

* Northampton is one of the principal, if not the largest, of manufacturing towns for boots and shoes in England.

capitalists to engage a number of hands in manufacturing goods which can be sold to advantage in a foreign market; a trade which brings back gold to be disbursed in more work to the people year after year, finding employment for many unskilled laborers, of both sexes, who, were it not for such inventions, would barely be able to eke out an existence. And yet such is the ignorance of the working classes as to those things that are ultimately for their advantage, that in every country opposition has been manifested to all labor-saving inventions. They cannot foresee that it is to the facilities afforded by such inventions the manufacturers of one country are successfully able to compete with those of another; and that without such facilities, the very trades by which they earn a living, would be monopolized by others, or that where 100 persons find employment in a factory working with old fashioned machinery, 1000 would gain a livelihood in another using machines of the highest degree of perfection, by which a better class of goods could be made and sold at a cheaper rate. The opposition that was shown to Mr. Côté at Quebec by the employés in the shoe trade, is only another instance of this suicidal policy against those who are their benefactors. What would Quebec be to-day without its shoe trade? It is owing to Mr. Woodley, Mr. Bresse and other enterprising boot and shoe manufacturers, that her labouring population are not now half a century behind the times. What does she owe to political favor—which she has for years been depending upon? Nothing whatever. Quebec, to recover her lost ground, must now turn her attention strictly to manufacturing, for which she is well adapted. She should be to Canada, what Lynn and Haverhill are to the United States.

In closing these remarks we cannot too strongly urge upon manufacturers in Canada the advantages of bringing the machines of their workshops to the greatest perfection, so as to be able to compete in finish, celerity and in price with all outsiders and to manufacture goods for foreign countries, as we are now doing in the boot and shoe business, in place of permitting foreigners to manufacture them for us, which would actually have been the case, had it not been for the energy and spirit of a few enterprising men. We advise all operatives to remember this fact, that there has been no instance within the last fifty years in which labour-saving machines have not vastly increased the demand for labour, and that where one person, through his talent or genius, has made a fortune by inventions or improvements in machinery, thousands of his fellow-men have gained a living thereby.

## THE HUNDRED TON GUN AT SPEZIA.

(See page 68.)

The experiments with the wonderful "King Gun" which has been made by Sir William Armstrong for the Italian Government, have made it evident that in the strife between offensive weapons and defensive armour the former have at all events up to the present time by far the best position. A few weeks since we published an engraving of the unshipping of the "King Gun" from the *Europa*; this week we have views of one of the targets against which the 2,000 lb. shots, vomited forth by the monster weapon, were directed. The first engraving shows the massive nature of the structure, and the second will give some idea of the enormous force with which the shots were propelled. Some of the targets were of steel, others of wrought iron, and each was twenty-two inches in thickness, with a four-foot backing of teak timber, behind which was a series of iron plates, the whole being supported by strong iron girders fastened against immense piles of teak, embedded in the earth.

## THE SANDRINGHAM CASKET.

(See page 68.)

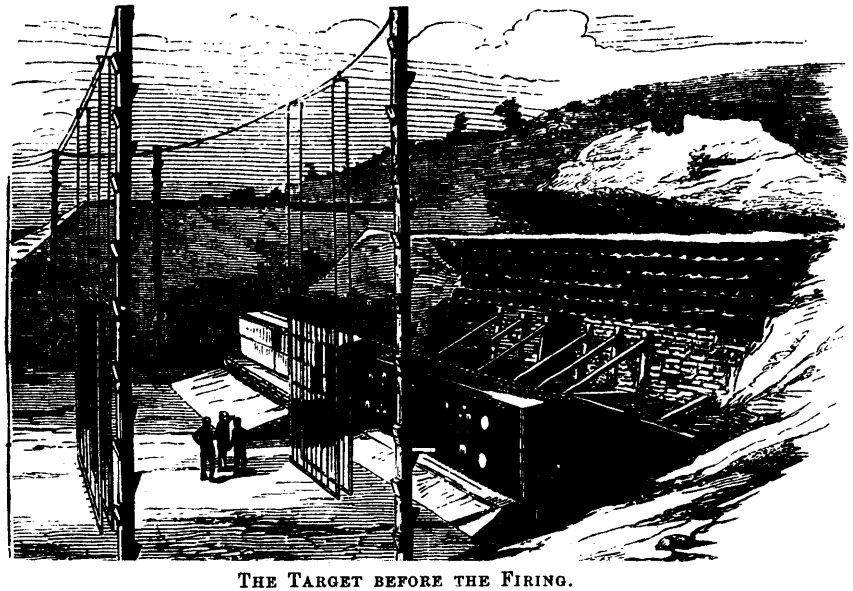
This elegant silver snuff-box, a New Year's gift from the clergy and tenantry of Sandringham to H. R. H. the Prince of Wales, was specially designed and made for the donors by Mr. Emmanuel, of the Hard, Portsea. The ornamentation is all in chaste Indian style. On the lid is a faithful likeness of the Prince in hunting costume, surrounded by his native attendants, and about to mount a richly caparisoned elephant which is kneeling to receive him. In the front of the casket appears the badge of the Star of India in gold, combined with the Prince's plume and the initials "A.E.," and flanked by the mythological monster *couchant*. The same animals are repeated on the back, and between them is the inscription: — "Presented by the clergy and tenants of the Sandringham estate to H. R. H. the Prince of Wales, K.G., G.C.S.I., &c., on his safe and happy return to his own place, after a most successful visit to British India, 4th July, 1876." The ends of the casket are ornamented with elephants' heads in high relief, with dolphins on each side, and the whole rests on the heads of grotesque animals.

DISCOVERY OF MICA.—The *New York Times* states that the schooner *Era*, which was despatched by a Philadelphia company a few months ago to Cumberland Bay, Baffin's Land, in search of graphite and mica, has returned from her expedition. The *Era*, which was under the command of Lieutenant Mintzer, of the United States navy, arrived at the place known by whalers as the Nialtic Valley, where the crew, which consisted of thirty men established a tramway and working sheds. The mica was found in veins 10 ft. below the surface, and some of the blocks brought back by the Mintzer expedition are of great sizes and purity, being nearly 20 in. square and weighing 50 lb. Altogether the crew of the *Era* obtained 15 tons of mica, and to do this exhausted three veins. The mica is estimated to be worth $5 to $12 a pound.

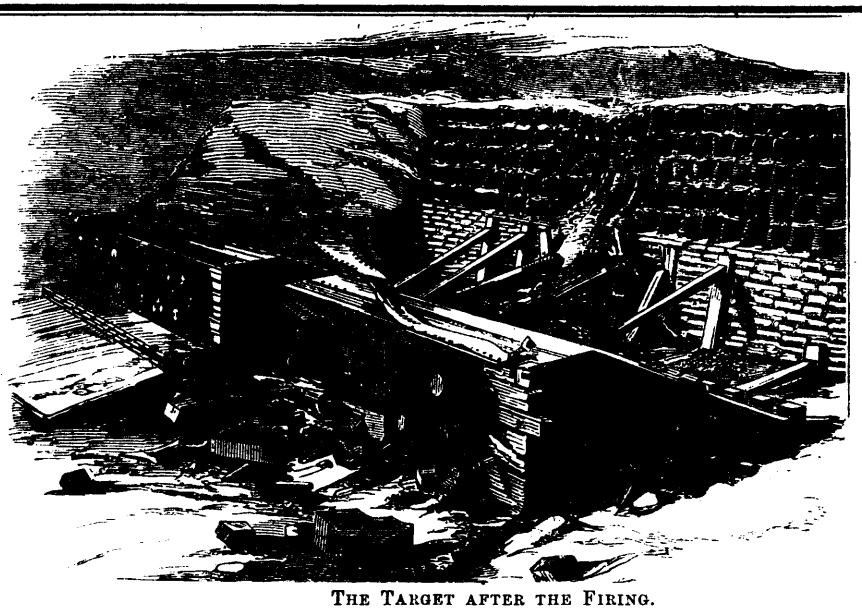
VARNISH FOR UMBRELLAS AND WALKING STICKS.—We annex two methods of colouring and varnishing sticks, paper, and which we can reccommend strongly.—No. 1. Use Judson's simple dyes; they are so clean, and moreover so economical in their application, that I believe they will take the leading part in all work of fancy or intricate workmanship. Put the stains on with a camel's-hair brush, diluted with water. For dark stains use copal varnish. For light woods use the light crystalised varnish, such as is used for the tops of washstands, &c. Old damaged sticks that were varnished should have the varnish eaten off with liquor ammoniæ, then rinsed, scoured, stained, and varnished again. No. 2. Make a solution of 3 parts of glue in 100 of warm water; to this add 1 part of whiting, 2 parts of orange chrome. Mix well. Apply hot with a soft brush to your sticks. When thoroughly dry, rub down with a piece of dry flannel. Apply a second coat of colour if deeper tints be required, or use burnt umber and brown ochre for oak tints. When dry, apply the following varnish:—Coarsely-powdered copal and glass, each 4oz.; alcohol, 64 O. P., 1 pint; camphor, ½oz. To be heated over a watery bath, with constant stirring, until the copal is dissolved. When cold, decant the clear portion. Be careful that alcohol does not inflame.

POLLUTION OF RIVERS.—Last week an illustration of the effect of river pollution through manufacturing refuse being cast into the stream, was afforded between Guilford and Godalming in Surrey, in the river Way. Tons of dead fish were found, and in such quantities as to be sold in the neighbourhood and in London for the purpose of manure. The cause of this has been traced to some paper mills situated on the Wey above Godalming, and the authorities are taking active steps to abate this nuisance. Should such an occurrence happen on a salmon or trout stream we imagine that there would be little delay in passing the River Pollution Bill during the present session, although already its discussion in Committee in the House of Commons has twice lately resulted in a "count-out." Action for public good is generally stimulated when powerful, although private interests suffer in a pecuniary point of view, and perhaps the "accident" here named may have the desired effect on our tardy legislators.

BE EMULOUS.—Don't be content with doing what another has done—surpass it. Deserve success, and it will come. The boy was not born a man. The sun does not rise like a rocket, or go down like a bullet fired from a gun; slowly but surely it makes its round and never tires.

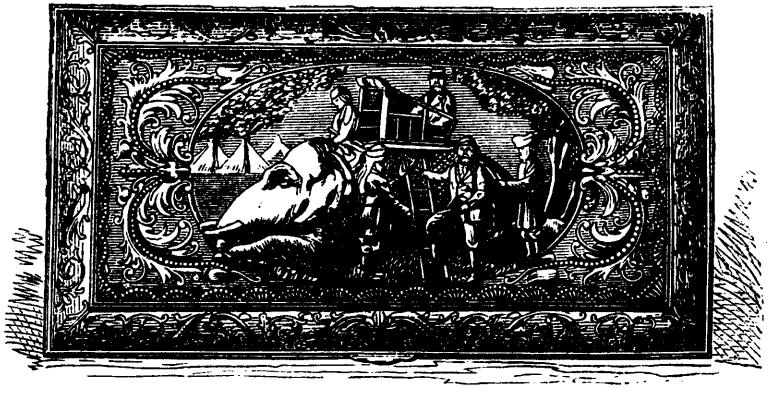


THE TARGET BEFORE THE FIRING.



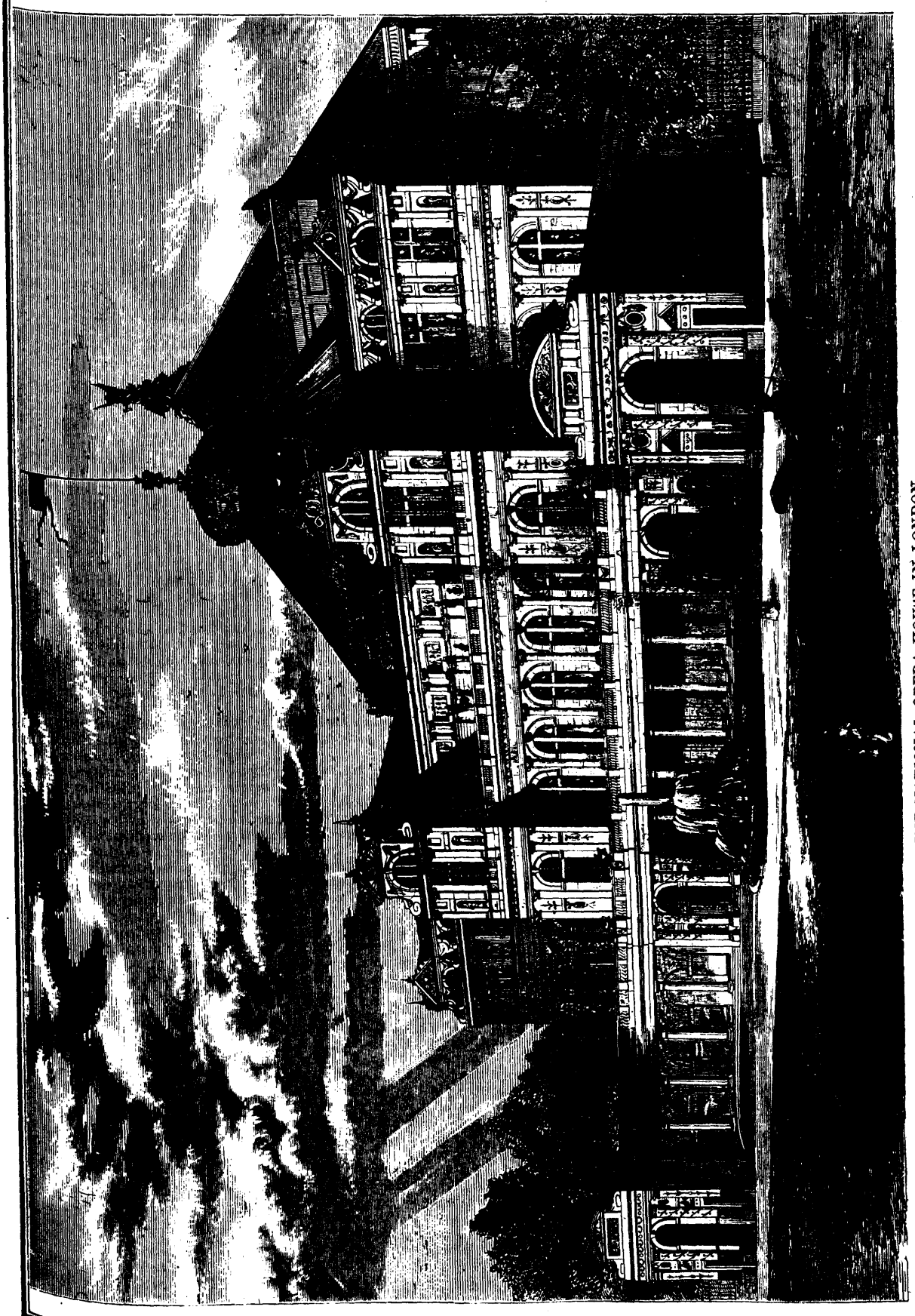
THE TARGET AFTER THE FIRING.

EXPERIMENTS WITH THE HUNDRED-TON GUN AT SPEZIA.



A NEW YEAR'S GIFT TO THE PRINCE OF WALES.

CASKET PRESENTED TO HIS ROYAL HIGHNESS BY THE CLERGY AND TENANTRY OF SANDRINGHAM IN COMMEMORATION OF HIS SUCCESSFUL VISIT TO INDIA.



THE NATIONAL OPERA HOUSE IN LONDON.

### SAWING GRANITE.

Among the interesting things that were shown to the architects in Philadelphia, during their convention, says the *Building News*, was the patented process of Messrs. Struthers & Sons for sawing granite. Hitherto it has been found impracticable to cut granite with a saw, since the ordinary sand process would cut only an inch and a half or two inches per day. The inventor of the Messrs. Struthers' process hit upon the idea of using chilled iron, finely divided, instead of sand. A jet of steam is directed upon a fine stream of melted iron, and blows it into spray, just as in the common atomizer a jet of air pulverises, so to speak, the stream of liquid upon which it is turned. The iron, divided into fine globules of, say, a fortieth or a fiftieth of an inch in diameter, falls into cold water and is chilled into excessive hardness. It is used under a saw of soft iron, and with a stream of water, as sand is used in sawing marble. Most persons would have supposed that the scratching of angular grains of sand would be more efficient than the rolling friction of globules of iron; but it would seem that the sand is speedily crushed into dust, while the tough iron, simply wearing down into smaller and smaller globules, crushes its way through the felspathic and other crystals of the granite (which with us is usually sienite, by the way, and not granite). The rolling of the globules is curiously shown by fine channelings or flutings, which score the under edge of the saw from end to end. By this device granite can be sawn at the rate of three or four inches per hour, and at small expense, the waste of the iron being about three pounds for every square foot of kerf, or two square feet of sawn surface. For small blocks, where a saw can be used that is short enough and therefore stiff enough to bear a heavy pressure without buckling, it is found possible to cut at the rate of 12 or 14 inches per hour. The surface obtained by sawing is vastly better prepared for polishing than a hammered surface, not only because it is smoother, but because by hammering the surface of the stone is "stunned," as it is termed; that is, the crystals are so bruised and shattered below the surface that it is necessary, before the polishing can begin, to grind away an eight of an inch or more, which is unnecessary with a sawn surface.

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THE formation of a petroleum has been explained by Mr. H. Byasson upon experimental grounds, as follows:—If a mixture of vapour of water, carbonic acid, and sulphuretted hydrogen be made to act upon iron heated to a white heat in an iron tube, a certain quantity of liquid carburets will be formed. This mixture of carburets is comparable to petroleum. The formation of petroleum can thus be naturally explained by the action of chemical forces. The water of the sea, penetrating into the cavities of the terrestial crust, carries with it numerous materials, and especially marine limestone. If the subterranean cavity permits these new products to penetrate to a depth where the temperature is sufficiently high, in contact with metallic substances, such as iron or its sulphurets, we have a formation of carburets. These bodies will form part of the gases whose expansive force cause earthquakes, volcanic eruptions, &c. Petroleum is always found in the neighbourhood of volcanic regions or along mountain chains. In general it will be modified in its properties by causes acting after its formation, such as partial distillation, &c. Petroleum deposits will always be accompanied by salt water or rock salt. Often, and especially where the deposit is among hard compact rocks, it will be accompanied by gas, such as hydrogen, suphuretted hydrogen, carbonic acid, &c.

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FEW persons are aware, says the *Washington Gazette*, that veritable Egyptian mummies are ground into paints. But in this country and in Europe mummies are used for this purpose—the asphaltum with which they are impregnated being of a quality superior to that which can elsewhere be obtained, and producing a peculiar brownish tint when made into paint, which is prized by distinguished artists both of this and other countries. The ancient Egyptians, when they put away their dead, wrapped in clothes saturated with asphaltum, builded, as it were, better than they thought, and could never have realized the fact that ages after they had been laid in the tombs and pyramids along the Nile their dust would be used in painting pictures in a world then undiscovered, and by artists whose languages were to them unknown. That a portion of one of the Pharoahs or a Potiphar, may even now be on the canvas of a Vernet, a Millais, or a Church, who may question?

### BORING GLASS.

A writer in the *English Mechanic* gives the following method: First, the drill is the main object and only thing to be careful of; you may use what you like to moisten it, either turps, camphor, paraffin, naypthy, or water—it matters not so long as the driil is right in shape and temper. To obtain such, go to the nearest watch tool shop, and get a graver of the size required, fix it in any suitable handle, and grind to the shape shown in the sketch, and if properly done, I will guarantee it to drill through a ¼in. plate in less than 1½ minute, even when worked by the hand alone. I have many delicate jobs to do that require an even pressure, so I have arranged a drill stock, as shown in sketch, which works admirably for any purpose. Explanation:—A, drill; B, archimedian stock; C, tube, containing spiral spring; D, spiral spring; E, wooden leg; F, screw, by which to regulate the pressure, and by which means any degree of regular pressure on the drill can be obtained as required.

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## THE BOOMER AND BOSCHERT PRESS.

(See page 70.)

There is a very extended and daily increasing requirement amongst many trades for the use of tolerably powerful presses. In addition to the now comparatively old application of presses for the expressing of oils from seed, lards and tallows, and juices from fruits, their utility and value for the compression of almost any light substance before transport is now being very generally acknowledged. We thus find hay, cotton, cloth, bales of any kind, and even tea, are now being subjected to heavy pressures for reduction of bulk and convenience in transport.

The principal forms of presses at present in use for these purposes are either direct vertical screw presses or else hydraulic. The vertical screw presses are open to very many serious drawbacks, where any considerable power is required. One of these is the size and weight of the screw required, and the very enormous loss caused by the friction of a large screw. These drawbacks arise from the form of construction. The whole gross load comes direct upon the sliding surface of the screw and nut. The loss by friction then—which is always in direct proportion to the load, and which amounts to at least one-tenth of it, and probably considerably more—increases as the load or resistance, and therefore, at the period of maxium pressure, very materially detracts from the efficient action of the press. Since, also, the gross load comes as a shearing strain upon the threads, and a bending strain upon the body of the screw, these must both be of large size, and therefore of expensive construction. In addition to all this, a single screw thread does not give sufficient mechanical advantage to produce so large a gross pressure as is frequently required, and consequently double or treble gearing must be employed to supplement the mechanical advantage of the screw. Those who have practically been troubled with the frequent breakages, and general wear and rattle of gearing, with fully appreciate that the employment of toothed wheels is a most serious drawback to the satisfactory working of a screw press.

The press we this week illustrate, as made by Messrs. Crossley Brothers, of Manchester, is a very ingenious mechanical arrangement to obviate the above detailed disadvantages in a screw press, and thus to give a maximum production of pressure with a minimum expenditure, and the least possible loss by friction.

The gross load is no longer thrown upon the sliding faces of the screw or nuts, but is transferred direct through toggle joints to the top frame, which is constructed of sufficient strength to resist this strain, and is united to the bottom frame by the usual wrought-iron tension bars. The screw itself is arranged horizontally, passing through the two nuts which form the centre joint pieces of the pair of toggles. The two halves of the screw are respectively cut with right and left handed threads. The rotation then of this screw will cause the two nuts to approach or diverge, according to the direction of rotation, with a perfectly uniform motion *pari passu*. This ensures a perfectly even and steady pressure upon the advancing or retreating platten, as the screw is fixed in a rigid central position by the vertically sliding arms above the platten.

The great mechanical beauty of this contrivance rests in the three facts: first, that by means of the use of toggle joints an enormous maximum power, at the moment of reaching dead centre, is obtained by the very simplest mechanical means and without gearing; secondly, that by this arrangement the pressure upon the screw and nuts is only a very small fraction of

the whole force exerted, and that this pressure on the screw does not increase with the maximum exertion of the press, but is rather smallest at that point; and thirdly, that the gradual increase of the ultimate of gross pressure upon the platten, accumulates from a constant force, which may be applied to rotate the screw, in the exact proportion as that in which the resistance increases by the increasing density of the material under pressure. This effect is not produced by any other screw or hydraulic presses, wherein the relative mechanical advantage at any point of the stroke always remains the same. This sadly retards the speed of travel, until the platten of such an ordinary press gets home on to its work, and limits its maximum pressure to that arranged for by its proportions.

In the Boomer and Boschert Press, which Mr. J. H. Ladd, of Queen Victoria Street, is introducing into this country, the gross pressure produced on the platten is practically unlimited, since, theoretically, the gross thrust is infinitely large at the moment in which the toggle joints pass their dead centre. In order to be able to discern the pressure actually produced at any point in the process, an ingenious index finger is arranged over the head of the top frame. The deflection of the top frame, small as it is, is reproduced upon the lever, which may be seen extending across the top frame. This is again transferred to a second multiplying lever by a pressure close to its fulcrum. The actual motion or deflection of the top frame will be thus multiplied, apparently some 60 or 100 times, at the ultimate index finger of the top lever, and, after due experiment, this deflection may be registered and read as so many gross tons' pressure upon the platten.

The action of the screw is produced either by a hand-wheel or by a power-wheel driven by a gearing chain. For the last final pressure, when the toggle joints are nearly perpendicular, the rotation of the screw is produced by a lock hand lever and ratchet-wheel keyed upon the centre of the screw. The maximum pressure may be thus given deliberately and with due care and caution, which is frequently a most important point in the successful squeezing of oily substances.

Our illustration represents a press specially designed for extracting oils, lard, tallow, &c. By this arrangement the obstacle to pressing in bulk has been successfully overcome. It is well known that, in consequence of the material clogging in the centre when a large mass is subjected to great pressure, the liquid cannot be all extracted, and the plan has hitherto been adopted in this country of dividing the material into small quantities, involving a great amount of labour and outlay in extensive plant. In the arrangement before us, the material is placed in the circular space between a strong hoop and an inner cone. Both the hoop and cone are made of strong wrought-iron bars, having spacee between to allow the liquid to escape, from both the outside and inside of the mass. The hoop is constructed to open out so that the material can be readily removed after having received the necessary pressure. By this means a great saving is effected over the old-fashioned method of pressing between plates.

Special appliances are employed for cider and wine presses, whereby a saving in labour of 50 per cent., combined with an increase of 20 per cent. in pressure, can be obtained as compared with an ordinary press.

The rapidity with which the platten travels in the first portion of its stroke until it comes to the last final squeeze must very materially facilitate the rapid turn out of the work, and it is said that the work effected by these presses considerably exceeds that turned out by ordinary presses of equal size. Some idea of the power which may be exerted by these presses may be gained from the fact that a press with platten 21 inches by 25 gives a gross pressure of 30 tons ; and a press of platten 36 in. by 48, a gross pressure of 400 tons.

The hydraulic press attempts to obtain this variation of pressure, to suit increasing load, with faster speed of travel at the commencement than at the end of the stroke, by the use of two or three press pumps, of which the larger ones are successively thrown out of action as the resistance increases. But this arrangement is not regular in its varying action, and at the best, an hydraulic press of any considerable power is a very slow and tedious traveller besides being expensive.

We understand that this press is being rapidly adopted by packers and oil manufacturers. Printers and bookbinders are also bringing it into use, and we may mention that we saw one recently in the warehouse of Messrs. Cassell, Peter & Galpin, where it is giving great satisfaction.—*Iron.*

## IMPROVED BELTING.

(See page 72.)

In the annexed drawing we illustrate the angular or V belting, which is said to be not merely the best form of belting, but the best means of transmitting power. The V belting has attracted some attention at the Centennial Exhibition, where it was employed to drive a large centrifugal pump. As will be seen from the diagram, it is made of truncated wedging pyramids of leather, the several plies being cemented together, and riveted to a continuous belt of ordinary construction. Flat belts slip to a greater or less extent, according to the conditions under which they are working, and round belts, when working in V grooved pulleys, though having less tendency to slip than flat belts, create friction where it is not wanted, for their action is that of a continuous wedging and releasing into and from the groove. Round belts working on semi-circular grooved pulleys give better results, but it would seem that the V-shaped belt gives the best. The belt is really in two portions. There is the ordinary flat belt to transmit the power, and added to it are specially devised means for gripping the pulleys, the wedges or truncated pyramids presenting a large surface for producing friction in the best manner. The wedges or truncated pyramids are placed at equal distances along the inside face of the belt, which thus has the appearance presented in the side elevation, as if wedges had been cut out of a flat belt, and the sides pared down to a V-shape. The angular belt, which is made by a New York firm, is said to be not only flexible and strong, but to have a high gripping power, adapting it for purposes where steady running is required under varying loads ; it is also very durable and cheap.

## THE LATE SIR TITUS SALT, BART.

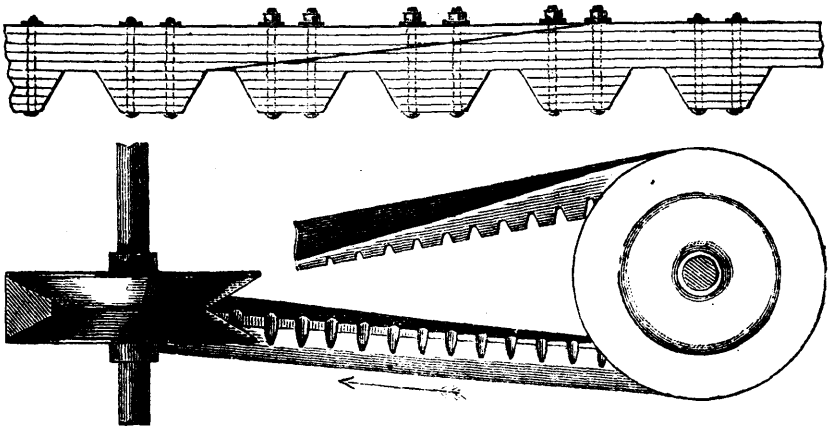
(See page 73.)

The death of this eminent mannfacturer and local benefactor of the West Riding has been noticed with appropriate testimonies of respect for his great works of public usefulness. It is a suitable opportunity for us to give an illustration of the monument which was erected in honour of him, two or three years ago, in the flourishing commercial town of Bradford. Mr. Adams-Acton is the sculptor by whom the statue was designed and executed, and it is generally approved as a faithful and characteristic likeness of Sir Titus Salt. The architectural canopy or shrine was erected by Messrs. Lockwood and Mawson. Our readers are probably aware that the magnificent industrial colony of "Saltaire"—a complete model town for a large working-class population attached to the alpaca and worsted or mixed factory—is situated near Bradford, on the banks of the Aire. Here the liberal proprietor erected above 800 comfortable dwelling-houses, a Congregational and Wesleyan Church, several schools, lecture-halls, clubs and institutes, baths and washhouses, hospitals, infirmaries, and almshouses, and laid out a park for the recreation of his workpeople. Sir Titus Salt likewise conferred upon the town of Bredford, which he once represented in Parliament, some direct benefits of considerable amount, by his donations to the Fever Hospital, Peel Park, and other institutions, as well as by his personal services in the borough Corporation. Besides the open-air monument shown in our illustration, there is a marble bust of Sir Titus Salt, upon a pillar and pedestal, in St. George's Hall at Bradford. It is the work of Mr. T. Milnes, and was presented to the town by the workpeople at Saltaire.—*Builder.*

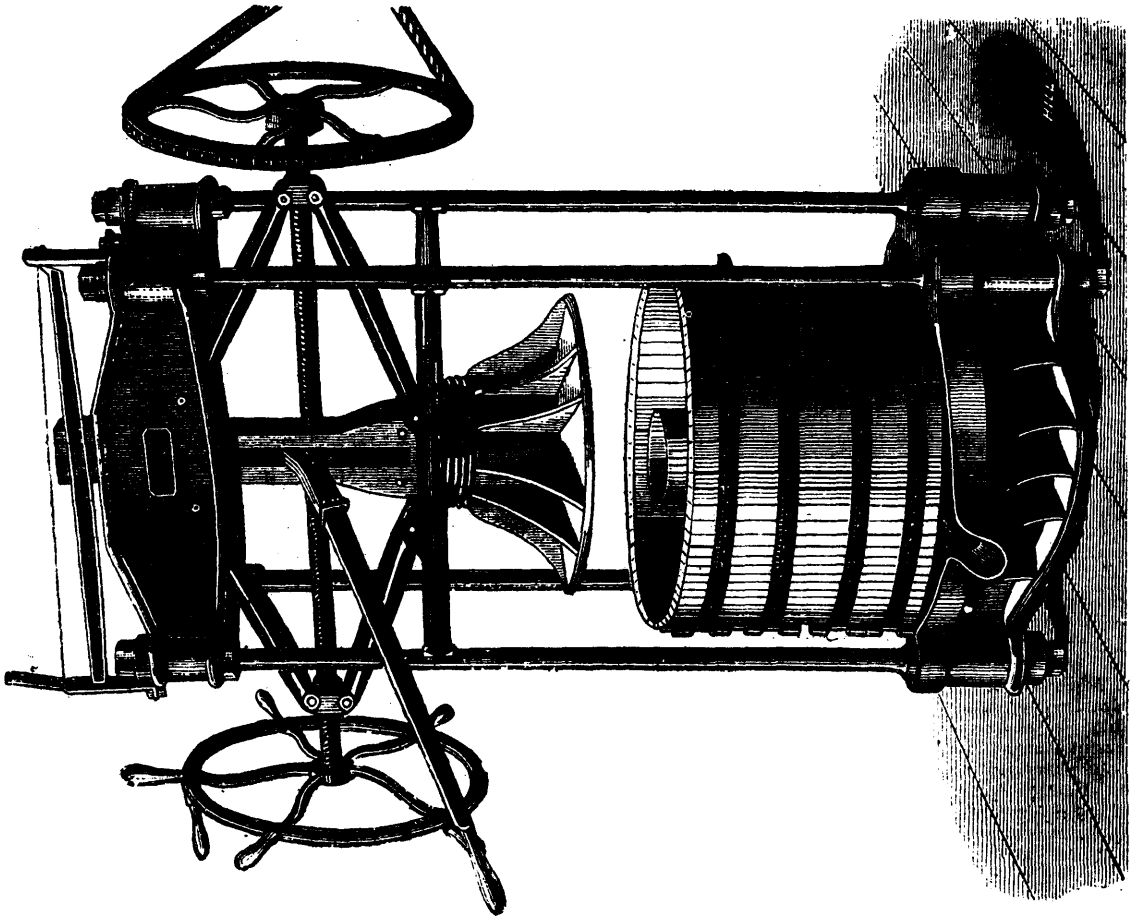
## THE DELHI CLOCK TOWER.

(See page 73.)

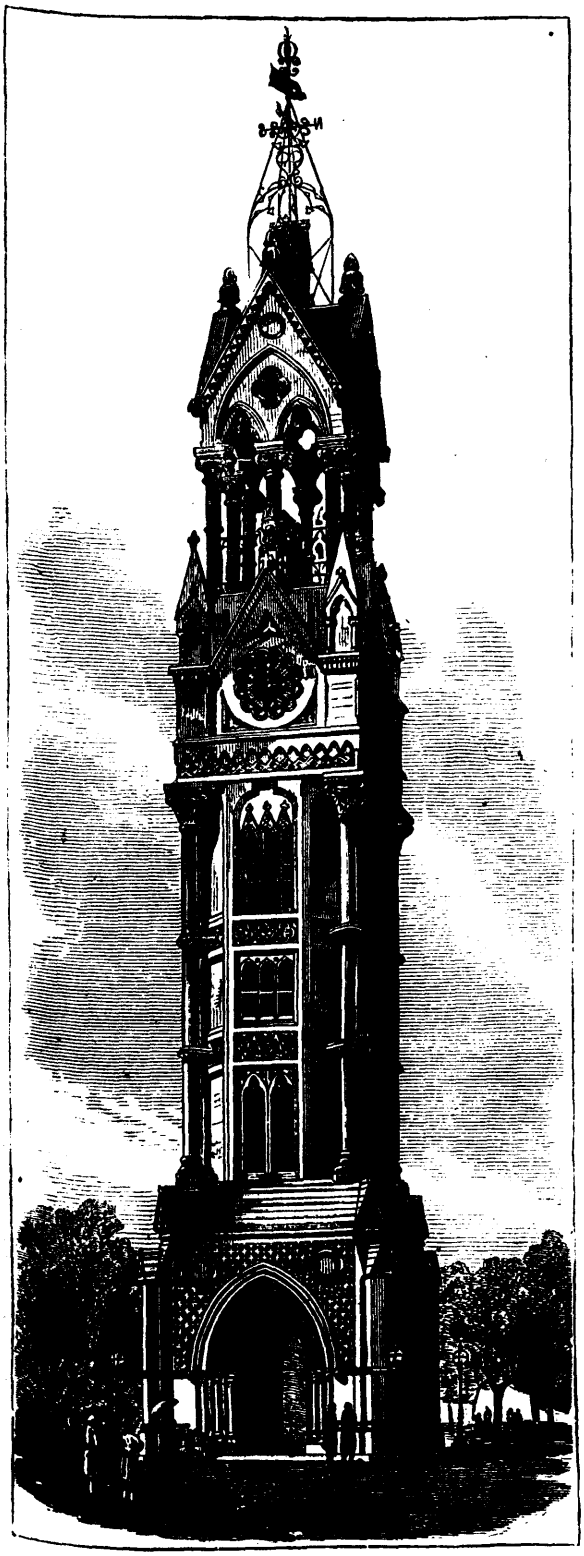
The municipality of Delhi has, of late years, effected great improvements in that city, where Queen Victoria was proclaimed Empress of India on New-Year's Day. The streets and roads are now, perhaps, the cleanest and best drained and repaired of any native city in India. Handsome English lamps, with cast-iron posts, have lately been introduced in all the streets. A fine Townhall, with a ball room, museum, library, and splendid durbar hall measuring eighty feet in length by forty feet in width and height, has been erected, in a commanding site, between the Queen's-gardens and the Chandnee Chowk. Trees have been planted along the sides of the roads ; large and handsome tanks have been built ; and almost everything has been done that taste or intelligence could suggest for the proper conservancy of this fine old "City of the Great Moguls." A great improvement is the new clock tower, erected in the centre of the street called Chandnee Chowk, opposite the Townhall. This building stands 115 feet in height above the roadway, exclusive of the handsome



IMPROVED BELTING.



THE BOOMER & BOSCHERT PRESS.



THE IMPERIAL DURBAR AT DELHI: THE CLOCK TOWER, DELHI.

MONUMENT IN HONOUR OF THE LATE SIR TITUS SALT, AT BRADFORD.

gilt vane. Its materials are brick, red and yellow sandstone, and white marble. The stone dressings and carving are beautifully executed, from the designs and models of the architect. The capitals surmounting the main corner pillars measures four feet three inches wide and four feet six inches deep; they are carved out of solid blocks of white sandstone, and each cap weighs over two tons. The dials are sufficiently elevated to be distinctly visible from the stations of the East Indian and Punjaub railways, and from other parts of the city. The building was completed in about eighteen months, at a cost, including clock and bells, of about 30,000 rupees (£3000), the whole of which sum was furnished by the Municipal Commissioners. The tower was designed and built under the superintendence of Mr. Edward Martin, Executive Engineer Rajpootana (State) Railway; the clock and bells were supplied by Mr. Benson, of Ludgate-hill, London.

## SCIENTIFIC ITEMS.

EMERY grinding stones were until recently made by mixing the emery with gum and shellac. It was found, however, that the shellac softened at high speeds, and the grinding stone, becoming greasy, ceased to polish. This difficulty is remedied by using, instead of shellac, soluble glass; this is done in certain German manufactories, the grinding stones of which are not corroded. They may turn at a velocity of 1000 to 2000 revolutions per minute without losing their form.

THE following statement shows the total number of miles of railway open and working in the British Empire to the most recent dates attainable, but mostly to the 31st December, 1875:—United Kingdom, 16,658 miles. British possessions—Australia—New South Wales, 437 miles; Queensland, 263; South Australia, 258, including railways worked by horse traction; Victoria, 618; British Guiana, 21; Cape of Good Hope, 149; Ceylon, 91½; Dominion of Canada, 4443; India, 6461; Jamaica, 25½; Mauritius, 66; Natal, 5½; New Zealand, 542; Tasmania, 167. Total in British possessions, 13,547½ miles; total in British Empire, 30,205½ miles.

WITHIN the last few days a fearful railway calamity was averted by the efficient action of the Westinghouse automatic brake. A train from London to the North was running at a high velocity in the dark, when the engine ran over a fog signal. The driver pulled up as quickly as possible, and stopped just nine yards in the rear of the last van of a broken down goods train, which the guard had not had time to sufficiently protect. The space traversed after the application of the brakes was very small, but the precise distance was not measured. The bearing of this circumstance on the Abbots Ripton accident will be readily perceived.

ACCORDING to the San Francisco *Chronicle*, another terrible instrument of war has been invented, by a resident of that city. The new gun, patented by Leonard and De Vry, and christened "Peace Conservator," was exhibited at the Pacific Ironworks. The prompt action of the instrument, delivering seventy shots in four seconds, and ten hundred and fifty shots in one minute, through a thick oak barricade, proves that it is one of the most terrible death-dealing inventions ever known. The machinery is simple and easily worked, requiring but few attendants, who are perfectly protected from their adversaries' bullets; and it can be transported with much greater ease than an ordinary six-pounder. The bullets from it will, it is claimed, diverge 300 ft. in 1000 yards—the distance claimed at which it will effectually deliver shots—and the gun can be easily worked by one person in any direction, or made to shoot almost solid.

THE first manufacturer of buttons in America was one Samuel Williston. While he was dragging along, says an American paper, as a country storekeeper—his eyes having failed him while studying for the ministry—his wife bethougt that she could cover by hand the wooden buttons of the time, and thus earn an honest penny. From this the couple advanced in their ambition, until they had perfected machinery for covering buttons, the first employed for the purpose in America. From this sprang an immense factory, and then others, until Samuel Williston made half of the buttons used in the world. His factories are still running at Easthampton, coining wealth for the proprietors, and known to every dealer in buttons all over the world. Samuel Williston is now between seventy and eighty years of age, and is worth from five to six millions of dollars, and has given 400,000 dols. to Easthampton for a seminary and churches, 200,000 dols. for the founding of a female seminary, and 200,000 dols. to Amherst College, besides lesser gifts to other kindred institutions.

THE well-know phenomenon that iron, with long use in which it is subject to strains of the nature of shocks, assumes a coarsely granular structure, has recently been illustrated by experiments made at the Friedens Hoffnung coal pit, near Waldenburg, on the hanging chain of the miners' cage, two years in use. A link of this chain broke at the first blow of an 11 lb. hand hammer into four pieces, whose surfaces of fracture showed a crystalline texture. Another link of the same chain, after having been annealed at a red heat, only broke after twenty-three blows with the same hammer, and in such a way that the fracture on the one side of the ring went right through, and the other side only half through, and presented a fibrous structure. These facts, says the *Scientific American*, indicate the importance in the arrangements for the lowering and raising of miners, of very careful observation of those changes of structure. They also appear to make desirable the introduction of spring boxes between the rope and the cage, so to modify shocks, and the annealing from time to time of the connecting parts between the rope and the cage.

A NEW RAIL NUT.—A new invention in the shape of a nut has been tried on the Boston and Albany Railroad. It is a little thicker than the ordinary nut, and across its face are sawed two slots crossing each other at right angles and cut almost through the nut. The opposite side of the nut is convex, so that when it is screwed up tightly its corners, being first made to touch the face of the iron behind it, cause the four sections of the nut, separated by the slots in front, to approach the centre of the bolt. This grip is tighter as the pressure behind it is greater, and it causes the threads of the nut to engage more deeply with those of the bolt.

OIL FROM WOOD.—In Sweden the manufacture of illuminating oil from wood has become a large and successful industry. The roots and stumps of trees are employed for the purpose. The wood is subjected to dry distillation, with exclusion of air, and a variety of products are formed which are of value in the arts. Among these may be mentioned turpentine, creosote, tar, acetic acid, charcoal, oil of tar and oil of wood. The wood oil cannot be burned in an ordinary lamp, but a camphene lamp can easily be adapted for the purpose. It is not explosive and is remarkably cheap. The pine tree is the best adapted for distillation, and there are fifteen establishments in operation in Sweden, three of which produce 15,000 litres (887 gallons) of oil annually.

NOTE.—If oil can be extracted from wood which grows in a climate as cold as Canada, the pine tree being the best adapted for the purpose, it would be very desirable that our Board of Agriculture should ascertain the exact process, as it might be very valuable to settlers in the backwoods to understand how to extract it.

SHARPENING EDGE TOOLS.—We obtain tee following from a German scientific journal:—It has lon been known that the simplest method of sharpening a rasor is to put it for half an hour in water to which has been added one-twentieth of its weight of muratic or sulphuric acid; then lightly wipe it off, and after a few hours set it on a hone. The acid here supplies the place of a whetstone, by corroding the whole surface uniformly, so that nothing further than a good polish is necessary. The process never injures good blades, while badly hardened ones are freuuently improved by it, although the cause of such remains inexplained.

TO LIGHT A CANDLE WITH WATER.—Get a very small piece of phosphorus, and with a little tallow, place it on the rim of a tumbler; next get a lighted candle, and after having extinguished it, hold it to the glass, and it will at once ignite.

SUBSTITUTE FOR PLASTER OF PARIS.—Best whitening, 2 lbs; glue, 1 lb; linseed oil, 1 lb. Heat altogether, and stir throughly. Le the compound cool, and then lay it on a stone covered with powdered whitening, and heat it well till it becomes of a tough and firm consistence; then put it by for use, covering with wet clothes to keep it fresh. When wanted for use, it must be cut in pieces adapted to the size of the mould, into which it is forced by a screw press. The ornament may be fixed to the wall, pictureframe, &c, with glue or white lead. It becomes in time as hard as stone itself.

NEW 150-TON GUNS.—Though designs for 160-ton guns have been prepared, there are good grounds for believing that the Government have no serious intention of ordering any of the size to be constructed, they having been advised not to go beyond guns of 150 tons for general service. Several of these will be made within the next twelve months, and it is probable that they will be used for both the land and sea service.

## BELL'S ARTICULATING TELEPHONE.

THE TRANSMISSION OF SOUND BY ELECTRICITY.

Attempts to transmit musical or articulate sounds to a distance by means of electrical communication have been made partially successful by the early experiments of Sir Charles Wheatstone in England, Philip Reiss in Germany, and Elisha Gray in the United States ; but it has been left to Mr. Graham Bell, of Boston, to invent an apparatus by means of which the sound of the human voice may be transmitted by electricity along a telegraph line, and heard, as a voice, at the other end. The articulating telephone of Mr. Graham Bell, of which we give illustration on page 76, consists of two parts, a transmitting instrument and a receiver, and all the parts are characterized by extreme simplicity.

The transmitting instrument, which is represented in Fig. 1, consists of a horizontal electro-magnet attached to a pillar about two inches above a horizontal mahogany stand; in front of the poles of this magnet—or, more correctly speaking, magneto-electric inductor—is fixed to the stand, in a vertical plane, a circular brass ring, over which is stretched a membrane, carrying at its centre a small oblong piece of soft iron, which plays in front of the inductor-magnet whenever the membrane is in a state of vibration. This membrane can be tightened like a drum by the three mill-headed screws shown in the drawing. The ends of the coil surrounding the magnet terminate in two binding-screws, by which the instrument is put in circuit with the receiving instrument, which is shown in Fig. 2.

This instrument consists of a vertical bar electro-magnet, inclosed in a tube of soft iron, by which its magnetic field is condensed and its attractive power within the area is increased. Over this is fixed, attached by a screw at a point near its circumference, a thin sheet-iron armature of the thickness of a sheet of cartridge-paper, and this, when under the influence of the transmitted currents, acts partly as a vibrator and partly as a resonator. The magnet, with its armature, is mounted upon a little bridge, which is attached to a mahogany stand similar to that of the transmitting instrument. The action of the apparatus is a follows : When a note or word is sounded into the mouth-piece of the transmitter, its membrane vibrates in unison with the sound, and in doing so carries the soft-iron inductor attached to it backwards and forwards in presence of the electro-magnet, inducing a series of magnecto-electric currents in its surrounding helix, which are transmitted by the conducting wire to the receiving instruments, and a corresponding vibration is, therefore, set up in the thin iron armature sufficient to produce sonorous vibrations, by which articulated words can be distinctly and clearly recognized. In former instruments the vibrations were produced by a make-and-brake arrangement, so that while a number of vibrations per second, as well as the time-measures, were correctly transmitted, there was no variation in the strength of the current, whereby the quality of tone was also recorded. This defect did not prevent the transmission of pure musical notes, nor even the discord produced by a mixture of them, but the complicated variations of tone, of quality, and of modulation, which make up the human voice, requires something more than a mere isochronism of vibratory impulses. In Mr. Bell's apparatus not only are the vibrations in the receiving instrument isochronous with those of the transmitting membrane, but they are at the same time similar in quality to the sound producing them ; for the current being induced by an inductor vibrating with the voice, differences of amplitude of vibrations cause differences in strength of the impulses. and the articulate sound as of a person speaking is produced at the other end. The practical working of Mr. Bell's telephone was shown last summer to a distinguished company of scientific men at the Centennial Exhibition, over a circuit of several miles of wire. Since that time the experiments have been successfully repeated on a circuit of one hundred and fifty miles, and there appears to be no doubt that an audible conversation, so to speak, could be carried on between persons stationed several hundred miles from each other. At the trial in Philadelphia, Professor Watson, of Ann Arbor, read extracts from the morning papers to Sir William Thomson, who was in another building constructively several miles away, and the latter recognized the voice of the reader, and wrote down what he said, to show that the words were accurately transmitted. Such sentences as the following were spoken with unmistakable distinctness by the circular disk armature of the magnet : "The Senate has resolved to print a thousand extra copies. The Americans in London have resolved to celebrate the coming 4th of July." The words were spoken by Professor Watson, at the far end of the telegraph wire, holding his mouth to the stretched membrane, carrying a little piece of soft iron, which was thus made to perform in the neighborhood of an electro-magnet in circuit with the line movements proportional to the sonorific motions of the air. The apparatus of Mr. Graham Bell is founded on the mathematical conception that "if electricity is to convey all the delicacies of quality which distinguish articulate speech, the strength of its current must vary continuously, and, as nearly as may be, in simple proportion to the velocity of a particle of air engaged in constituting the sound." It will be seen from this that, single as the instrument appears to the eye, it is the result of profound mathematical calculations combined with an intimate knowledge of the vibratory movement of sound and of the laws of electrical phenomena.

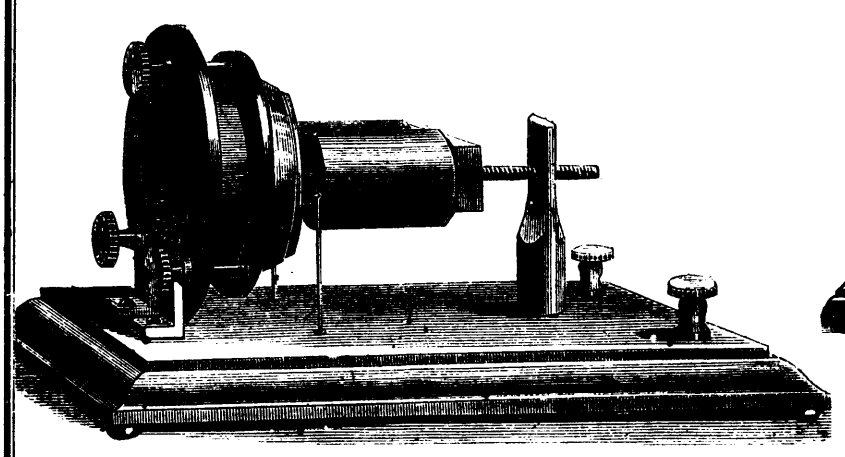
## AUSTRALIA A CUSTOMER FOR CANADIAN TIMBER.

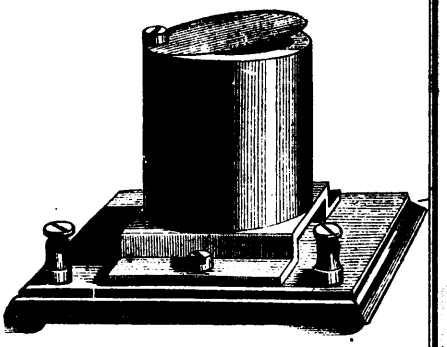
A correspondent writes from Canada to the *Timber Trades Journal* as follows : — "There is a circumstance connected with the Centennial Exhibition that may result in some benefit to the timber trade in Canada. The Australian Commissioners on duty at Philadelphia were so struck with the excellence and cheapness of several Canadian manufactures, that they expressed the utmost confidence in the possibility of establishing a direct trade between the sister colonies. One of the Commissioners visited the principal cities in the Dominion, and insisted strongly on the advisability of sending samples of several articles manufactured here to the Australian Exhibition, which is to be opened at Sydney in April, 1877. The Boards of Trade representing the leading commercial centres sent delegates to Ottawa to learn how far the Dominion Government would assist in such an enterprise, and the latter, with a readiness which does them credit, stated their willingness to pay the carriage of exhibits to Australia, and to send three commissioners thither, in order to study the commercial position of that country, and to fully report thereon. A vessel was chartered, and sailed from Montreal last fall. Several lumber manufacturers will send specimens of their goods ; but, what is of better augury, the same vessel carried some sawn lumber that had been purchased here by an Australian contractor, Mr. Nation, from the Hon. J. Skead, say 70,000 ft. board measure, and 20,000 laths. This is a mere sample order, but a contract has been entered into between the same parties for 1,500,000 ft. per year for three years. Messrs. T. W. Currier & Co. have also sold a number of doors, which will be shipped by the same vessel."—*Builder.*

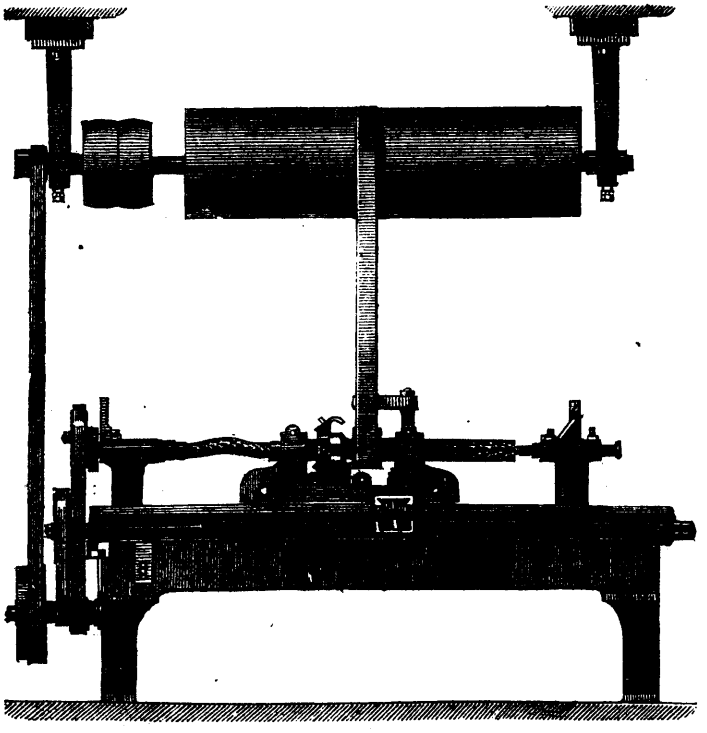
A DANGEROUS MATERIAL.—Within three years, says the *Commercial Bulletin*, there have been three shops destroyed in Massachusetts through lampblack. A hand damp with perspiration, a drop of water, a bit of grease, or a sprinkle of oil, will create combustion which will start the lampback aglow like charcoal, and so ignite the package, and hence the blaze. In lampback factories, while great precaution is taken to prevent fires, a rainy or sharp frosty day will start a dampness upon the inside of a window-pane, and the flying particles of dust lighting upon this, create a spark, which, communicating with the pile, may send a glow of fire with wonderful rapidity through the galleries of the shop.

GOLD LABELLING. (U. Q.)—The gold labels on chemists' bottles are gilt exactly as in common gilding—*i e.*, a band of the width of the intended label is painted in gold size, thickened with a little red ochre, the gold leaf is then laid on this, and patted down with a piece of cotton wool. When thoroughly set the words and border lines are painted on in black (with Brunswick black and lampblack), and finally varnished with copal varnish. A common label is made from gilt paper with the letters printed in, which are affixed to the bottle with a stiff "jeweller's cement' (isinglass steeped in water and then dissolved in spirits of wine in which a small quantity of gum mastic has been dissolved), and finally varnished as before. Gold labels in earthenware are usually painted in before the final glazing, and then burnt in. These are almost indelible, and are far superior to every other kind for resisting acids, alkalies, &c. Paper labels can be affixed very securely to glass, &c., by means of acetic glue, made by dissolving pale Russian glue, previously soaked in water till well softened, in glacial acetic acid. When dry the labels should have a coating of the finest copal varnish. For use with such a cement the labels must be gilt and not Dutch metal. If the labels be gilt with the latter metal the best cement is one made with sandarach and white lac dissolved in spirits of wine.

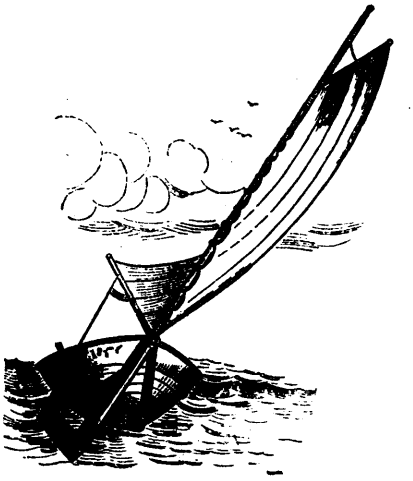
BELL'S ARTICULATING TELEPHONE FOR TRANSMITTING SOUND BY ELECTRICITY.



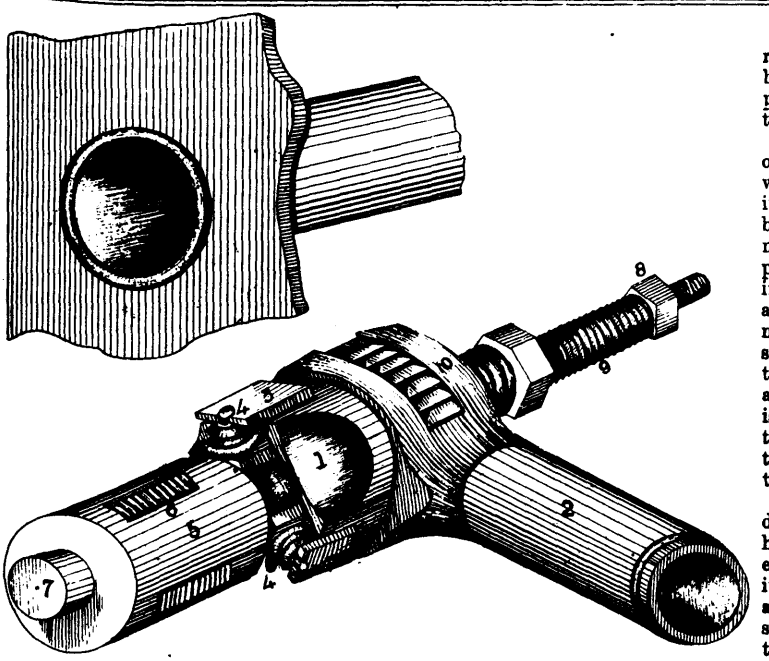




MACHINE FOR TURNING ELLIPTICAL AND CROOKED WORK.



A NON-HEELING BOAT.



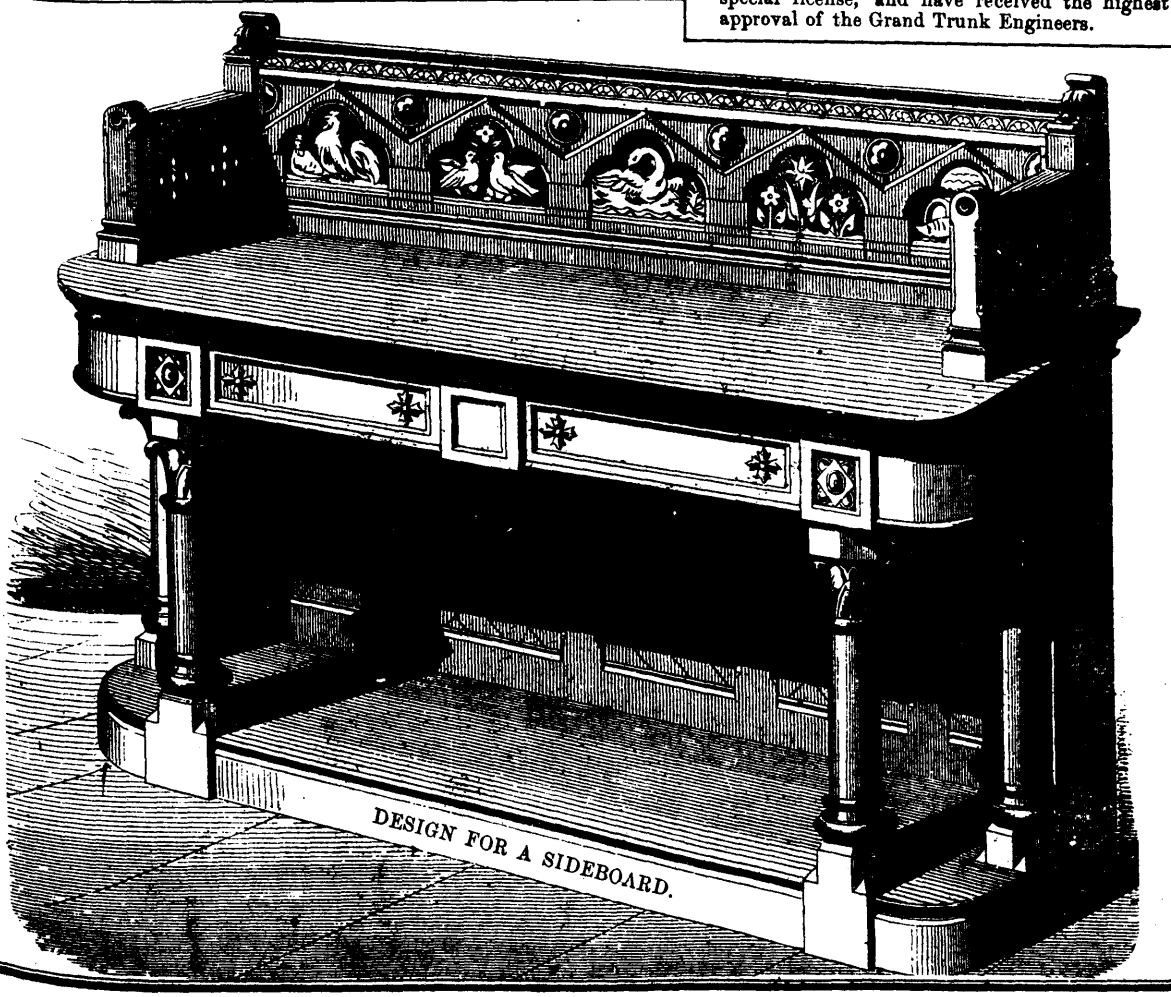

Mr. G. S. BRUSH, of the Eagle Foundry of this city, is proprietor of the Canadian Patent, and will furnish any desired information.

THE accompanying illustration is an imperfect representation of a tool both novel and unique, being the first invention of the kind for the purpose of beading or riveting the ends of boiler tubes in the tube sheets.

The tool itself consists of a revolving head 1, operated by means of a lever handle and ratchet wheel 2, in which head blocks 3 are fitted carrying steel rollers 4, turned to the shape of the bead required. The head revolves around a mandril 5, in the base of which recesses are provided for the dogs 6, which hold the mandril in place. These dogs are set out to their work by a taper pin 7, passing entirely through the mandril, and operated by a screw and nut 8. For setting the revolving head up to its work, a thread is cut on the outer end of the mandril, and a nut 9 fitted, between which and the head is a roller washer 10. All the parts above mentioned are of steel and most of them hardened; they are made to guage, and interchangeable in their respective sizes.

In operation the tool is simple, not liable to derangement, and can be worked by any ordinary hand. It is much speedier as well as more effective than hand work, and instead of weakening the staying capacity of the tube as is inevitably the effect of hand work, this tool upsets and strengthens the tube, and more effectually stays the tube sheet. It will even close up and tighten tubes that have been split in expanding, and will tighten tubes that have worked loose much more effectively than can be done by an expanding tool.

These tools are now being manufactured and used by the Grand Trunk Railway Co., under a special license, and have received the highest approval of the Grand Trunk Engineers.



DESIGN FOR A SIDEBOARD.

## FURNITURE DESIGNS.

On page 84, we give an illustration of a side-board in oak carving and decoration, painted, designed, and manufactured by Messrs. Cox & Sons, in London, and also a counter, the panel ornaments of which are in *terra cotta*, by the same firm. On page 77, will be found two tasteful designs for a clock and key rack, taken from that excellent German publication, *The Workshop*.

We are indebted to the American *Builder* for these cuts.

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We regret that we have been obliged to postpone the continuation of the article we copied on page 39 in our last number, taken from an English sciéntific paper, on the Chief Systems of Sewage Disposal now in operation; it will be continued in April Magazine.

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## MACHINE FOR TURNING ELLIPTICAL AND CROOKED WORK.

(See page 76.)

The annexed illustration represents in elevation a machine devised by Mr. John Richards, the well-known author of the text-book on wood working machines, for turning elliptical and curved articles, such as spokes for wheels, tool handles, &c. It represents in a striking manner the skill and ingenuity which Americans bring to bear upon the construction of machines for special work. The machine before us is not capable of doing all sorts of work, nor even a great variety of work, but it is capable of doing all sorts of work for which it was designed, and of doing it well. It will turn from 1,200 to 1,400 lineal feet of elliptical work in ten hours, and a brief description will suffice to explain its action which can only be thoroughly understood by occular inspection. The material to be operated on is mounted on a pivoted swing frame, and the desired form is obtained by moving the material to the cutters, the latter being confined to a straight line, as shown in the engraving. The cutters are mounted on a carriage with wheels, which is made very heavy so as to resist the effects of the motion of the cutters, which are driven at a high velocity, about 8,000 ft. per minute. The pattern piece is carried on the same plane as the work to be turned, and for the description of article shown in the engraving, is placed at the end of the piece to be turned, or, as it were, on the same spindle. A screw, seen in front, the motion of which is regulated by change-wheels, gives a positive feed. American machines for doing special kinds of work are gradually attracting the attention of English manufacturers, and though our own inventors of wood-working machines are not inferior in skill and ingenuity to their rivals over the water, they have undoubtedly learnt some useful lessons from them. At the same time the economy which is possible with the use of machines in the United States is necessarily in some branches of industry reduced to a very small percentage here, owing to the comparatively low wages paid for skilled handicraft.

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## MOORE'S UNIVERSAL ASSISTANT.

Although this valuable work has had a very large sale, yet many of our readers may not have seen it and will doubtless be glad to know where they can obtain a Hand-book containing such a number of Industrial Facts. It is just the kind of book that should have a place on the shelf in every Mechanic Library. On our advertising page will be found a list of its contents and from whom it can be obtained.

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A Little Giant.—A trial was recently made at the machine shop of Johnson, Hess & Co., Philadelphia, of a new application of power, with steam, to a five-wheeled engine, for propelling city railway cars. The application of power is so decided that under a pressure of only a few pounds of steam to a diminutive engine of only 4 in. stroke, a large truck. with several tons of iron on it and some fifteen men, was pulled and backed for several hours, without apparent resistance. It is the opinion of those who witnessed the trial that this little giant will pull fifty tons with ease, with no smoke or noise from the exhaust of any account.

## HOLLOW CONCRETE BLOCKS FOR BUILDING.

A hollow concrete block for general building purposes has been introduced by Mr. James Woodhouse, of Lambeth. It resembles a block of stone molded in such a form that a vertical and horizontal groove or cavity is retained, so that really it possesses the advantages of a hollow brick. One of the single blocks is 2 feet long, 1 foot wide, and 9 inchcs high, in the centre of which are apertures formed by grooving the block all round and perforating the center; but the material can be worked up into blocks of any size. Quoin blocks are also made for working at the angles of buildings, and ornamental courses can be molded for cornices or string courses. When the blocks are put together, the apertures, both vertical and horizontal, are continuous, allowing a free circulation of air throughout the entire wall, ensuring ventilation and dryness. The blocks are proposed to be connected be cemented joggle holes or joints, by which they are joined together with great precision. The blocks can be moved and fixed by the lewis and can be laid by an ordinary bricklayer. A bricklayer can lay about four hundred bricks per day, equal to 25 cubic feet; and as the wages of the bricklayer and laborer are $2.50 gold, in England, per day, the cost of brickwork for labor is about 9½ cents per cubic foot. It is stated that any bricklayer can lay 50 of these concrete blocks a day. equal to 75 cubic feet, thus showing a saving of over 200 per cent in labor. The advantages claimed are: Greater strength, damp-resisting qualities, resistence to fire, expedition in use, vermin expulsion, general applicability, sanitary qualities, cheapness, appearance, facilties of manufacture, etc. The author alludes to these advantages in order. Speaking of the strength of concrete, the author says concrete walls have withstood the most violent equinoctial hurricanes. The absorbency of brick and stone is well known. A common brick absorbs about a pint of water, and a small house of one-brick walls, cantaining 12,000 bricks, is capable of holding 1,500 gallons, or 6½ tuns of water. Absorbant bricks also retain dirt and gases, but the concrete blocks insures dryness in walls, so essential to health; it is fact, nearly non absorbent. Of the fire-proof qualities of the concrete block, being composed of burnt clay, scoriæ, clinkers, shingle, etc., it is hardly necessary to dwell as our readers know the refractory nature of these component materials. In gravel concrete, great heat would disintegrate the mass, and cause fractures; but with the burnt ballast, slags, etc., used in the patent block, the most intense heat would be powerless to destroy the mass.

Another advantage in favor of this block construction, from a sanitary point of view, is the absence of mortar joints, through which vermin and germs of animal life can pass. The author also considers the advantages of concrete block walls from another point of view. By molded forms cheaper ornamentation can be obtained, and it is thought this will conduce to the adornment of our humble dwellings. The cost of this kind of walling in gold is stated comparatively as follows: 1 foot cubic plain faced masonry, built complete, 66 cents; 1 foot plain-faced brickwork, 24 cents; 1 foot plain-faced patent block, 18 cents; 1 foot molded masonry, $1,08; 1 foot molded brickwork, 30 cents; 1 foot molded patent block, 24 cents.

The author, in conclusion, believes the old-fashioned brick wall must give place to this kind of walling. At all events, one great inducement is facility of manufacture. The ingredients—pounded shingle, burnt clay, slag, etc., can be procured on any site, as most lands have gravel or clay, all that is required being the mold. We have long advocated concrete blocks for wall building; several kinds of blocks have been introduced at different times, and we believe Mr. Woodhouse's patent hollow concrete block is a simple and effectual mode of obtaining the combined advantages of concrete—durability, lightness of walling, and damp-proof qualities.

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Fish Skin Leather.—The *Commercial Bulletin* has the following: Shoes have been manufactured in Gloucester, Mass., from the skin of the cusk. They are said to be strong and give evidence of durability. If the new material for shoes proves what it promises, it will open up a new market for fish skins which will no doubt be highly profitable. A patent has been applied for. The cusk belongs to the cod family; and we see no reason why the skins of a large number of useless fish that are now swimming about doing nothing may not be utilized. They would be glad of the chance.

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One-half of the mines in the State of Pennsylvania have stopped work, and over 40,000 men thrown out of employment.

# SCIENTIFIC.

### THE NEW TRADE IN AMERICAN CARCASS MEAT.

At an agricultural meeting, held at Madbury on Monday last, Sir Massey Lopes warned his bucolic hearers that they must expect serious competition in the meat trade by the importation of fresh carcasses from abroad. The warning is a timely and judicious one, for the export of fresh meat from New York has already become a staple trade ; and the new process is perfectly applicable to much longer voyages than that from the Hudson to the Mersey. The Liverpool merchants who have gone into the trade are persons of position and standing in the commercial world, who are determined to push the new enterprise with vigour and determination. In order to prevent a repetition of such fiascos as that which lately threw the whole Smithfield supply into the hands of the retail butchers of London at about a penny the pound, to be resold to their customers at the ordinary retail prices, the importers intend opening shops for the sale of American fresh meat in Liverpool, Manchester and other provincial towns. The fact is that for the present exorbitant price of butcher meat the retailer is chiefly responsible ; but these special shops will keep the butcher in order, and they may be set up the readier that the public have already become accustomed to similar changes in the machinery of distribution. After the butcher comes the market salesman, and last of all the farmer, who has too often good reason to complain of the paucity of his returns. And if the landlords take large portions of their estates into their own hands, as several extensive proprietors in the North are reported to be about to do, the farmers' lookout is of the darkest.

### NOVEL DANGERS.

We have frequently referred to the new dangers that affect life and health in modern times, especially from chemical manufactures and discoveries that were unknown to our ancestors, arsenical colours and aniline dyes among the rest. Elder wine was made in the olden time, but then in the operation old-fashioned wooden buckets were used. These have been supplanted by zinc vessels, which, acted upon by the acid juices of the fruit, have lately been the cause of several instances of poisoning in the rural districts. Circulating libraries are an invention of late times, and Mr. Greenwood has just pointed out that Mudie's and other circulating libraries may be easily the means of spreading small-pox and other infectious diseases, from the use of the books by patients during convalescence, a period when the exuviæ of the skin in some diseases are peculiarly contagious. Finally, the conveniences of modern times in the supply of water to houses, coupled with the careless habits of the British workman, have nearly caused the poisoning of a Lord Mayor. Floating on the top of the largest cistern in the Mansion House, according to the General Purposes Committee of the Common Council, three-quarters of an inch of "fungi scrub," whatever that may be, has been seen ; and from that cistern are supplied all the other cisterns used for domestic purposes in the Lord Mayor's official residence. At the bottom of that cistern also three-eighths of an inch of mud were found, and in a bottle of water placed on the Lord Mayor's own table were seen hundreds of worms. Luckily, his Lordship has a full cellar of the best, and need not drink water ; so the worms might have been allowed to remain, to remind him that, like the Scotch bailie, although a magistrate he is still but a mortal man ; yet he might perchance have drunk a glass from a caraffe after a feast, and perished like Herod. It seems that certain British workmen had been employed to clean the civic palace fot its new occupant, and had shamefully shirked their work in the cisterns as well as elsewhere.

### THE ARCTIC EXPEDITION.

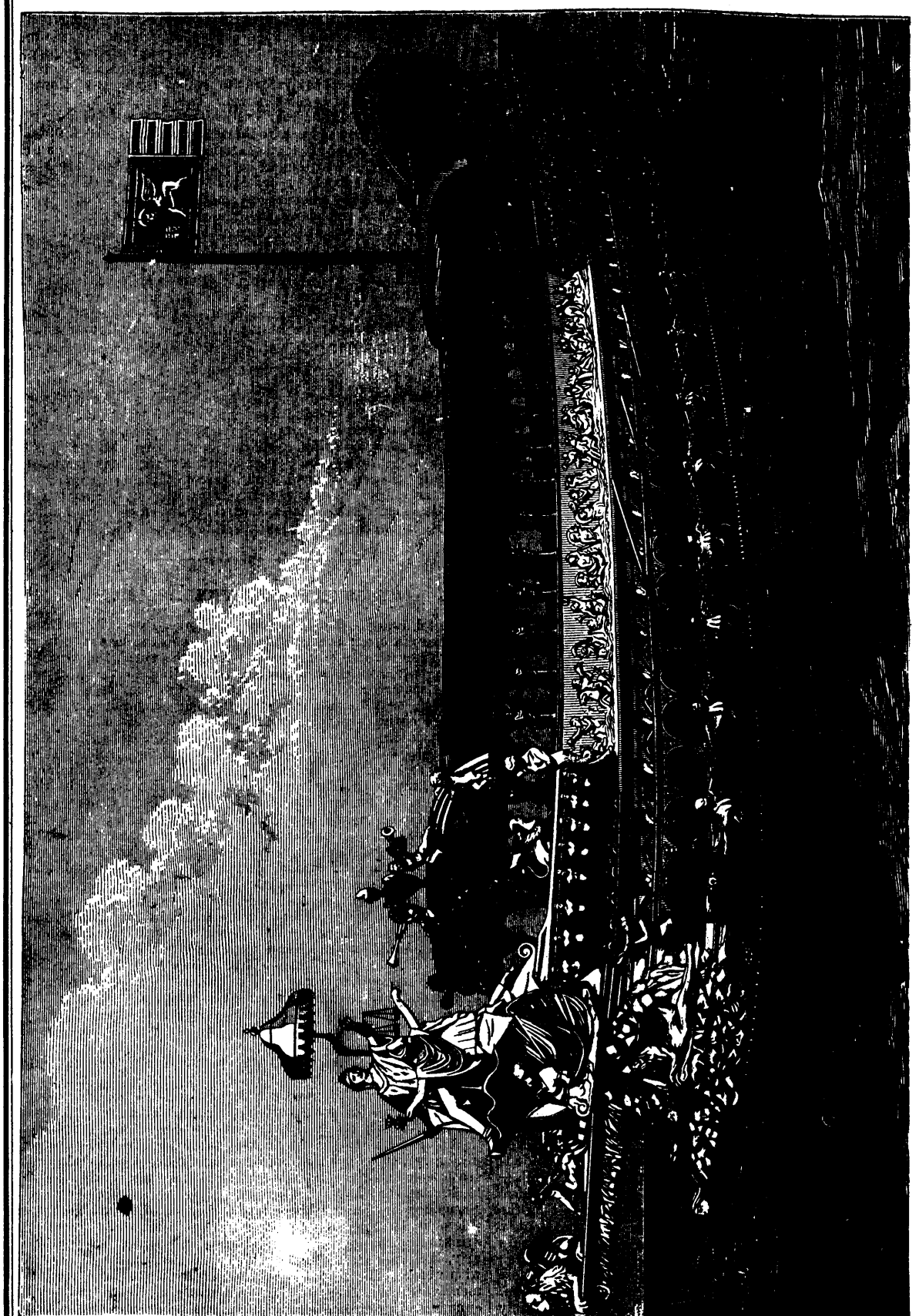
It is a pity that the Admiralty have not thought fit to publish fuller details of the expedition. A number of documents, such as the sledging journals, have indeed been printed, and even circulated, but amongst a very limited coterie. It would almost seem as if it were wished to suppress the painful details—tragically painful they are described in a well-informed medical journal, which says the sufferings of the men engaged on the sledging expeditions were frightful. "Before they were out a week or a forthnight they were ravaged by scurvy ; their limbs swelled ; their teeth fell loose ; the blood was effused in patches ; one-half of them became prostrate, fetid, miserable beings, whose existence was intolerable to themselves and those around them. Every sledge party without exception broke down prematurely from scurvy. Not only so, but the disease seems to have taken all the commanders of sledge parties by surprise ; each in turn expresses his astonishment, horror, and terror of this affliction when, its full force being felt, he can no longer shut his eyes to its nature, and each bewails pathetically his want of lime-juice." Nothing like this has befallen any maritime expedition since the days of the ancient navigators, to whom the anti-scorbutic virtues of lime-juice were unknown. It is evidently not to the officers of the expedition that this lamentable breakdown is to be attributed ; they appear to have been fully aware of the virtues of the prophylactic so strangely neglected ; but it is rumoured that the Whitechapel tars at Whitehall sent out the ships, otherwise splendidly provided and manned, with a short supply of what is by common consent, and from about a century's experience, considered an almost perfect preventive of one of the gravest dangers of long voyages. Mr. Clements Markham and other defenders of the Admiralty have been insinuating that lime-juice is not so effective as it is generally believed to be, but that fresh meat is the only remedy, forgetting that even the long acclimatised Esquimaux are often affected by scurvy, although they live exclusively on meat, and never use salt. In such cases they apply to scurvy grass, the well-known anti-scorbutic.

### COOL.

The Commissioners of Patents have issued a notice to the effect that when a specification gets out of print, they "are willing" to reprint it as supply copies at cost price, on condition that the person requiring them prepay the cost of reprinting. That he might do without the intervention of the Commissioners; but surely the public have a right to expect that a department which nets £100,000 a-year clear, should keep up the supply of these documents, which forms part of its duties, without calling upon its customers to provide it with its stock-in-trade.—*Iron.*

## CAUSES OF MORTALITY IN ENGLAND.

The following article from our exchange, *Iron*, will be read with deep interest, as several valuable lessons can be drawn from it : "Though there is only one way into the world, the avenues leading out of it are innumerable. According to the registrar general, however, whose report for 1874 has just been issued, two-thirds of the deaths in England in that year, and presumably in other ordinary years, occur from one or other of 15 causes. Bronchitis heads the list, killing over 53,000 persons ; next comes phthisis, which answers for more than 49,000 ; then atrophy and debility, for nearly 40,000, most young children. Old age, which Dr. Farr qualifies as that which should be the highest in the list, was the cause of 28,604 deaths, more than 26,000 of which were of persons over 65 years of age, some of them centenarians, the proportion of men to women being as 12 to 76. Heart disease, apoplexy and paralysis are increasing, doubtless owing to the increased worry and rush of social life. Cancer, too, is growing more fatal, but consumption appears to be on the decrease. Hydrophobia is twice as fatal as it was 20 years ago ; and the number of violent deaths was 17,920, the highest number yet registered. Nearly all were from accident or negligence ; but the executions reached the unusual number of 18, and there were 1,592 suicides. There were 1,249 persons killed on railways in some way or other. The year's returns show 1,313 persons killed by horse conveyances ; tram-cars killed 62, omnibuses only 55 persons. By cabs 61 persons were killed, and by carriages 82, and this limitation of the numbers is noted as implying great skill on the part of the drivers in streets often crowded. There were 942 deaths from injuries in coal mines, and 118 from injuries connected with copper, tin, iron and other mines. Deaths by poisoning increased to 461, about a third of thembeing ascertained suicides. There were 25 boys and men, nearly all following outdoor occupations, killed by lightning. Sunstroke was fatal to 90 persons, and 114 deaths were ascribed to gelation and exposure to cold. There was a death from the bite of a fox, from the bite of a rat, from bite of a leech, from the sting of a hornet, and two from sting of wasp. An epidemic of scarlet fever raised the mortality of 1874 considerably, and there was an increase in the deaths from excessive drinking. An augmented death rate from infantile diarrhea may, it is suggested, have been owing to the mixture of sewage with water. The deaths from accident andfrom the other last mentioned causes, as well as from many of those previously enumerated, with one exception, might be greatly diminished by proper care on the part of the State and of individuals."



THE BUCENTAUR, AFTER THE ORIGINAL IN THE ARSENAL IN VENICE.

# THE FAMILY FRIEND.

This part of the MAGAZINE, for the future, will be devoted to instructive domestic reading for the *Home Circle*, such as SHORT PLEASING STORIES, DRAWING, MUSIC, BOTANY, NATURAL HISTORY, POPULAR GAMES, and amusements for boys and girls, NEEDLE WORK, AMATEUR MECHANICAL PURSUITS, and all the elements of a *practical domestic education*; also GARDENING and AGRICULTURAL NOTES.

## FLORAL CULTURE.

FORGET-ME-NOT.—(Myosotis.) Nat. Ord. Boraginaceæ. *Linn. Pentandria Monogynia.*—A favorite and well-known border plant, flowers early, blooms freely, and indispensable for Spring gardening; from Britain. *Half-hardy perennial.*

MAURANDYA.—Nat. Ord. Scrophulariaceæ. *Linn.—Didynamia Angiospermia.*—These superb climbers cannot be too strongly recommended; they are particularly adapted for greenhouse or conservatory decoration, or for training in columns in the flower garden; remove them before the approach of frost. *Half-hardy perennials.*

MOMORDICA.—Nat. Ord. Cucurbitaceæ. *Linn.—Monœcia Monadelphia.*—Trailing plants, with curious and very ornamental foliage; the fruit is of a *golden yellow* color, warted, and when ripe, opens, disclosing its seeds and brilliant *carmine* interior. Planted on rock-work, stumps of trees, and allowed to ramble, they produce a very striking effect. *Half-hardy annuals.*

NASTURTIUM TALL, (Tropæolum Majus.)—Nat. Ord. Geraniaceæ.—A well-known and exceedingly ornamental genus of very handsome, profuse-flowering plants, which are admirably adapted for rock-work, banks, covering trellises, or rustic work; the seeds, if pickled young, are an excellent substitute for capers. *Hardy annuals.*

MAURANDYA BARCLAYANA.

NASTURTIUM DWARF.

MEREMBERGIA GRACILIS.

SWEET MIGNONETTE.

SENSITIVE PLANT.

ŒNOTHERA LAMARCKIANA.

MEMORDICA BALSAMINA.

FORGET ME NOT.

NEMOPHILA MACULATA.

MIGNONETTE.—Nat. Ord. Resedaceæ. *Linn.—Dodecandria Trigynia.*—A well-known fragrant favorite, which produces a pleasing contrast to the more showy occupants of the parterre; if well thinned out immediately the plants are large enough they will grow stonger, and produce larger spikes of bloom; the seed should be scattered about shrubbery and mixed flower borders, where it grows readily. *Hardy annuals.*

NEMOPHILA.—Nat. Ord. Hydrophyllaceæ. *Linn.—Pentandria Monogynia.*—This is perhaps the most charming and generally useful genus of dwarf growing hardy annuals; all the varieties have a neat, compact and uniform habit of growth, with shades and colors the most strikingly beautiful, so that ribboned, sown in circles, or arranged in any style which the fancy may suggest, the effect is pleasing and very striking. *Hardy annuals.*

NIEREMBERGIA.—Nat. Ord. Solanaceæ. *Linn.—Pentandria Monogynia.*—Charming little plants, which flower profusely during the whole Summer; well adapted for hanging baskets and edgings; from South America. *Half-hardy perennial.*

NIGELLA, (Love in a Mist, or Devil in the Bush.)—Nat. Ord. Ranunculaceæ. *Linn.—Polyandria Pentagynia.*—A genus of very interesting, compact growing, free-flowering plants, with curious looking flowers and seed pods. From the extraordinary appearance of the stamens, this genus has received its singular names; grows freely in common garden soil; from Spain. *Hardy annuals.*

ŒNOTHERA.—Nat. Ord. Onagraceæ. *Linn.—Octandria Monogynia.*—A magnificent genus, one of the most useful and beautiful either for beds, borders, edgings, or rock-work. All the varieties are free-flowering, and most of them perennials. The most remarkable of the perennial kinds are Œnothera grandiffora Lamarckiana, with superb spikes of large flowers; Œnothera macrocarpa, splendid for beds or edging, flower six inches in diameter; Œnothera acaulis, flowers *silvery white.* Of the annual varieties Œnothera Drummondii nana and Œnothera Veitchii, succeed in any good rich soil.

SENSITIVE PLANT, (Mimosa.) Nat. Ord. Leguminosæ. *Linn.—Polyngamia Monœcia.*—Very curious and interesting plants, their leaves closing if touched or shaken; may be grown out of doors in a warm situation; peat and loam. *Half-hardy annual.*

## HOME TOPICS.

(By FAITH ROCHESTER.)

### EARLY EDUCATION.

I have just gathered a little bundle of reading matter to lend to a friend in another town; and, as she may be supposed to be especially interested in all that bears upon the subject of babies, I have placed side by side two books, neither of them new, which may serve well to complement each other—"Ginx's Baby" and "The Child." The former, a good satire, and treating of politico-social economy, cannot fail to deepen in the mind of a thoughful reader a sense of the danger of neglecting the early education of future citizens. Though one cannot help smiling at the fine touches of the satirist, one is moved at the same time with horror and compassion over the condition of the lower strata of humanity. Perhaps London is worse than any American city, but we need to be stirred to the depths of our hearts over the ignorance and misery and consequent wickness of millions of our fellow creatures. If we turn from the strange fortunes of that typical character, "Ginx's Baby," to Madam Kriege's book, "The Child," we can see, at least by faith, what may be the destiny of the human race on earth, in future ages: for surely we shall at last learn—if not in your day and mine, in some generation not far distant—the necessity of giving human beings a careful education in their earliest and most impressible years. A "careful education" does not mean a deal of molding and binding, and hacking and hewing of the young immortal, but it means at least a healthful and happy atmosphere for soul and body both, and simple nourishment suited to the needs of both soul and body, and for natural exercise of all the developing faculties in a manner promotive of the private and public welfare.

For the best success in this business of educating the young, associated effort is certainly necessary. "All are needed by each one." Young parents with only one child can hardly appreciate this fact. They mean to do their duty by their child, and they love it so dearly that they imagine themselves ready and able to supply all its needs. Family influences are strong, but they are by no means all powerful. Few fathers and mothers exert an entirely wholesome influence upon their children, and there are besides neighbors and schoolmates of every variety of character. Our children have to be educated for life in the world as they find it, and so contact with society is as necessary as it is natural. For children, is needed a society of their equals, or the companions of school and the playground, and these exert an influence upon our children's habits, opinions, and aspirations, too strong to be disregarded in our account of educational influences. So, for very love of those descendants who we call "our own," if for no broader or more humane reason, we must labor for the general education or for the establishment of free schools adapted to every age. At present you and I may not be able to find public primary schools where we dare to place our tender little ones; the public schools are sometimes too crowded, too low in their social tone, and badly managed in sanitary regards, as well as deficient in wise intellectual culture and wholesome moral stimulus.

But no parent can afford to withhold sympathy from the public school's. When the kindergarten is at last a part of the public school system, all over the country, we shall have taken a long step toward "peace on earth and good will among men." It is a great thing to accomplish, but it will cost far less than our present reformatories, and prisons, and various police arrangements for preventing and punishing crime. All the effort used to establish good schools for children of all ages and conditions tends to make less and less expenditure necessary for restraining and reforming bad men and women.

### MISS BAILEY'S PAPER CUTTING.

Reforming old sinners is a slow and difficult task—we must lay the axe at the root of the tree of evil, and work earnestly to train up the young—all of them, rich and poor, Jew and Gentile—in the way they should go. If you and I cannot do anything in particular to push forward the kindergarten movement, we can serve the cause by waiting patiently for it, ready to take hold of the good work whenever it comes our turn, doing our own work meanwhile with the little ones around us as best we can, in the absence of the various helps and facilities which we know to be most desirable.

### HOME TAILORING.

If every wife would make her husband's coats, vests, and trousers, what a nice sum she might earn him each year! But then, why ought she any more than he should make her shoes and bonnets?

No, my brethren, not one of you must expect that, as a matter of course, your wife will always make even your shirts, and you surely must not expect that a woman, who has never served an apprenticeship as tailoress, will make you stylish outer garments. In a spasm of economy I decided that, considering our circumstances, including the fact of my possession of a sewing machine, it was my duty to learn to make the "everyday" clothing of my husband. He brought home an unmade coat and trousers cut by a good tailor. By studying his best tailor-made suit I was able to get the trousers together properly, but I gave up the coat in despair, first spending some precious hours in the study of a coat which I thought to use as a model. I at length gave it up, and the coat went to a tailor to be made up. I had thought to line it, and make it up for a winter coat, but since I have ripped up an old coat, and discovered the wadding, and stiffening, and stuffing used in its manufacture, I am glad I did not persevere and spoil the garment. A tailor would have charged nine or ten dollars to have made the coat as I intended. It was finally made for spring without a lining, and, simple as the modest sack appeared in its construction, four dollars were paid for stitching those seams, hemming the bottom, and making three or four button-holes. I doubt whether the cloth cost more. I think I *could* make such an unlined sackcoat as that now, having practiced on boys' clothing with Butterick's patterns, but if a tailor thinks the job worth four dollars when the garment is all cut, I need not feel ashamed if I cannot rival him when I have served no apprenticeship. There is a knack about the pockets and the collars which the uninitiated can hardly expect to attain. In making our own frocks we often leave the pockets till the last thing, but pockets are of the first importance in a man's equipment, and you must make the pockets all right the very first thing. But one thing I can do, which I consider a valuable accomplishment in present circumstances. I can take a well-worn pair of grown-up trousers and make them over for a boy of ten, with very little labor, and so that they will do considerable service for home or school wear. Rip them apart and rip open the inside seam of each leg. Then lay your patterns upon each leg close to the unripped seam. At the top, you can cut them so as to retain the pockets and bank, while cutting away the worn fronts. If the back has worn thin, the patches set in come so

low down on the new and smaller pair, as to attract little notice. The knees are probably the worst part, and it is the easiest way to amputate the leg at the top of the worn portion, and, cutting it off again just below the bad place, sew the top and bottom together, matching the seam, of course. Possibly the same straps and buckle may be used behind without altering their former position.

### CHILDREN'S TEETH.

I have been looking at my little girl's teeth, and neither she nor I can tell exactly which ones belonged to the first and which to the second set. This leads me to regret that I have not kept memoranda of all such matters pertaining to my children's development. I have seen a book advertised, especially designed for this purpose, and I think young mothers would do well to provide themselves with one on the first appearance of "a babe in the house." It should be kept private, and every important physical change noted, with its date. Facts of this kind are sometimes of great service to the family physician, when called upon to prescribe for a member of the family. Parents often try vainly to remember just when some accident happened, or some childish sickness, which proves to have far-reaching and unforeseen results. It is interesting to observe the dental changes of a child. The coming of each little tooth in the first set is a great event in the family, but to the child itself, the process of second teething is deeply interesting. Here is a little girl by my side who feels more pride over a vacant place among the front teeth of her lower jaw than over any other feature of her face. She is sure now that she is growing up like other children, and she watches every day for the coming of her first "second tooth." Her sister, who never had any difficulty at all about getting her first set of teeth, used to complain a year ago of great uneasiness in her jaws when the new double teeth were pressing through. You know, probably, that the first set of teeth has only eight double teeth, (or molars), and the child gets one or more of these grinding teeth on each side of each jaw, or four new molars, when it gets its second teeth. The "wisdom teeth" come later in life, and sometimes with considerable pain. Some dentists and physcians think it a matter of great importance that children should have a plenty of bone-forming food all through the growing years, and investigation has convinced them that children fed on a plain diet, consisting largely of milk, oatmeal or graham, with lean beef, (if any meat), and vegetables and fruit, and little or no cake or sweet-meats, have better teeth—less trouble with the teeth every way—than children who eat considerable molasses, sugar, cake, and candy.

I saw a good dentist removing tartar from a lady's teeth after having filled several cavities. He used simple pumice-stone, which he said was the basis of many tooth powders. This he applied with a small pine stick, so scouring the teeth. Afterwards I treated the teeth of two little girls in the same manner. Their teeth had been neglected until they had a dark yellowish border next the gums. Simple washing with a tooth-brush would not remove this, but after one scouring with the pumice-stone, they were easily kept clean by the daily use of a tooth-brush. Well kept teeth do not need "scouring," and powders of all kinds should be cautiously used. Children should be taught to take care of their teeth, to keep them clean, and to avoid all abuse of these useful members.—*American Agriculturist.*

## CARE OF THE SICK.

*(Continued)*

### MILK COMPARED WITH MEAT.

Again the nutritive power of milk, and of the preparations from milk, is very much undervalued; since there is nearly as much nourishment in half a pint of milk as there is in a quarter of a pound of meat. But this is not the whole question, nor nearly the whole. The main question is what the patient's stomach can assimilate or *derive* nourishment from, and of this the patient's stomach is the sole judge. Chemistry can not tell this. The patient's stomach must be its own chemist.

### DIET FOR THE WELL AND DIET FOR THE SICK.

The diet which will keep the well man healthy may kill the sick one. The same beef, which is the most nutritive of all meats, and which nourishes the healthy man, is the least nourishing of all food to the sick man, whose half-dead stomach can *assimilate* no part of it—that is, make no food out of it. On a diet of beef-tea, healthy men, on the other hand, speedily lose their strength.

### HOME-MADE BREAD.

Patients have been known to live many months without touching bread, because the *kind* they wanted could not be had, and they could not eat baker's bread. These were mostly country patients, but not all. Home-made bread or brown bread is a most important article of diet for many patients. The use of aperients may be entirely superseded by it. Oat-cake and bread made of Indian-meal are others.

### SOUND OBSERVATION HAS SCARCELY YET BEEN BROUGHT TO BEAR ON SICK DIET.

To watch for the opinions, then, which the patient's *stomach* gives, rather than to read "analyses of foods," is the business of all those who have to settle what the patient is to eat—perhaps the most important thing to be provided for him, after the air he is to breathe.

Now, the medical man who sees the patient only once a day, or even once or twice a week, can not possibly tell this without the assistance of the patient himself, or of those who are in constant observation of the patient. The utmost the medical man can tell is whether the patient is weaker or stronger at this visit than he was at the last visit. The most important office of the nurse, after she has taken care of the patient's air, is to take care to observe the *effect* of his food, and report it to the medical attendant.

### TEA AND COFFEE.

A great deal too much is said against tea (*) by wise people, and a great deal too much of tea is given to the sick by foolish people. When you see the natural and almost universal craving in the sick for their "tea," you can not but feel that nature knows what she is about.

### NOT TOO MUCH OF IT.

But a little tea or coffee restores them quite as much as a great deal; and a great deal of tea, and especially of coffee, impairs the little power of digestion they have. Yet a nurse, because she sees how one or two cups of tea or coffee restores her patient, thinks that three or four cups will do twice as much. This is not the case at all; it is, however, certain that there is nothing yet discovered which is a substitute to the patient for his cup of tea; he can take it when he can take nothing else, and he often can take nothing else, if he has not it. It would be very desirable if any of the abusers of tea would point out what to give to a patient after a sleepless night, instead of tea.

### TEA IN THE MORNING.

If you give it at 5 or 6 o'clock in the morning, he may even sometimes fall asleep after it, and get his only two or three hours' sleep during the twenty-four. At the same time, you never should give tea or coffee to the sick, as a rule, after five o'clock in the afternoon. Sleeplessness in the early *night* is from *excitement* generally, and is *increased* by tea or coffee; sleeplessness which continues to the early *morning* is often from *exhaustion*, and is *relieved* by tea.

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R. Reboux states that at the eocene epoch the bed of the Baltic sea was occupied by an immense forest, which spread over nearly the whole northern continent. Dredging carried on at a depth of 1·4ft. below the sea bottom has brought to light thereby two species of conifers, a poplar, a chestnut, and various other trees. From the conifers, the author thinks, ran the resin which through being buried in the earth, has become changed into amber. The largest quantity of the gum appears to have been derived from the *pinus succinus*. More than 200 specimens of objects have been found imbedded in the gum, including insects, reptiles, plants, leaves, grains, shell, fruit, &c. The density of natural amber varies from 1·09 to 1·11. Its analysis, according to Schrotter, is: Carbon, 78·82; hydrogen, 10·23; oxygen, 10·90.

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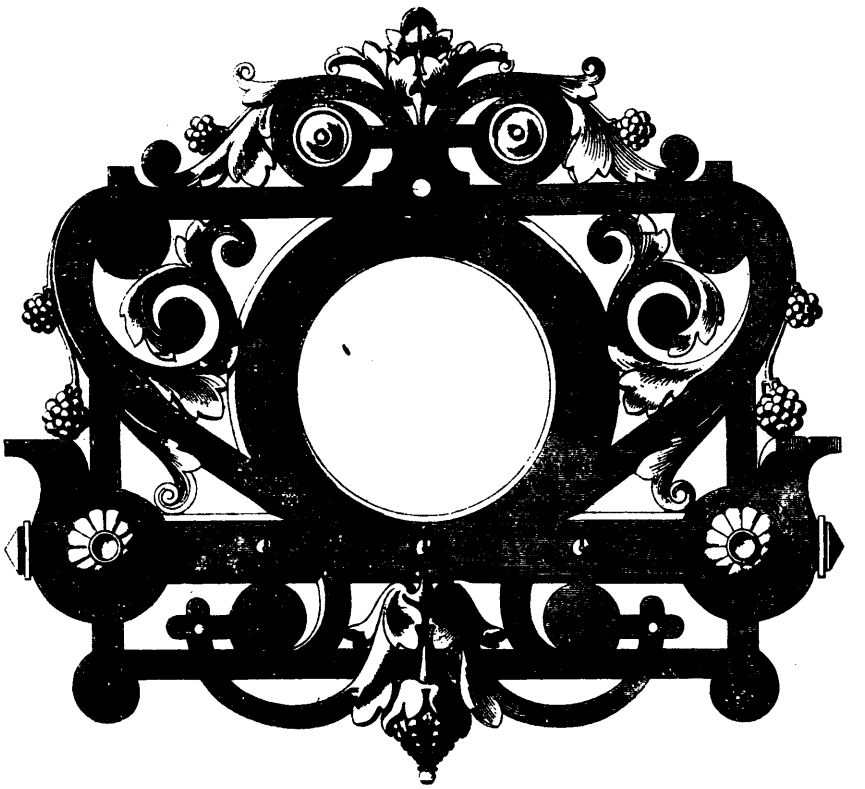
(*) It is made a frequent recommendation to persons about to incur great exhaustion, either from the nature of the service, or from their being not in a state fit for it, to eat a piece of bread before they go. I wish the recommenders would themselves try the experiment of substituting a piece of bread for a cup of tea or coffee, or beef-tea, as a refresher. They would find it a very poor comfort. When soldiers have to set out fasting on a fatiguing duty, when nurses have to go fasting in to their patients, it is a *hot* restorative they want, and ought to have before they go, and not a cold bit of bread. If they can take a bit of bread *with* the cup of hot tea, so much the better, but not *instead* of it. The fact that there is more nourishment in bread than in almost any thing else, has probably induced the mistake. That it is a fatal mistake there is no doubt. It seems, though very little is known on the subject, that what "assimilates" itself directly, and with the least trouble of digestion, with the human body, is the best under the above circumstances. Bread requires two or three processes of assimilation before it becomes like the human body.

The almost universal testimony of men and women who have undergone great fatigue, such as riding long journeys without stopping, or sitting up several nights in succession, is that they could do it best upon an occasional cup of tea—and nothing else.

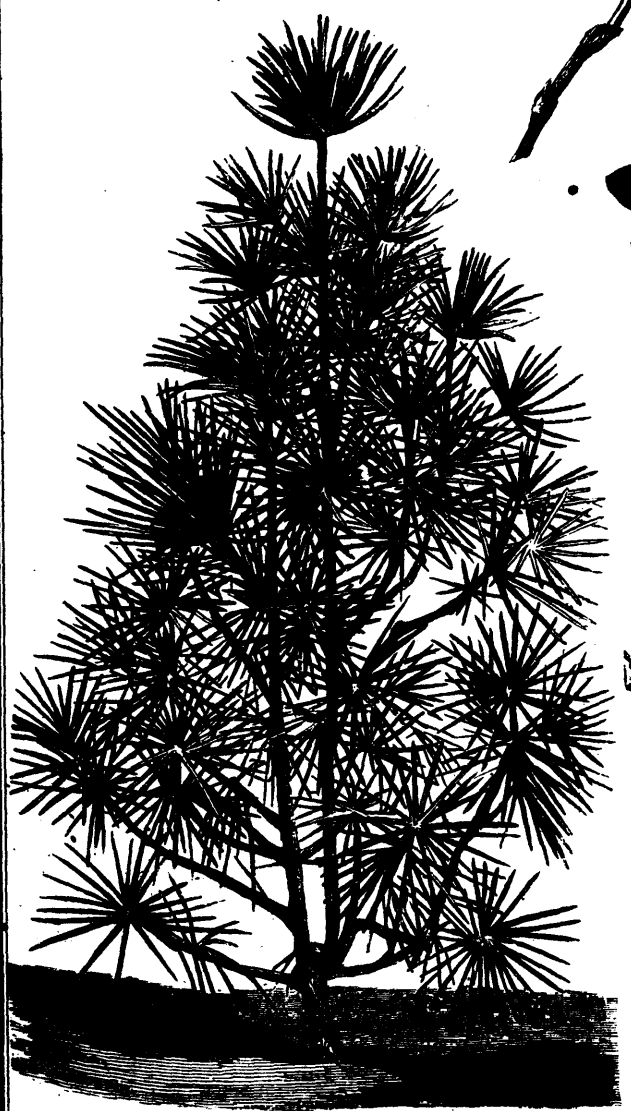
Let experience, not theory, decide upon this as other things.

## FURNITURE DESIGNS.



KEY-BOARD AND CLOCK HOLDER.

THE LABRADOR BAKE-APPLE.



UMBRELLA PINE OF JAPAN.

MENTZELIA ORNATA.

## THE UMBRELLA PINE OF JAPAN.

SCIADOPITYS VERTICILLATA.)

(See page 85)

Though the Umbrella Pine was described nearly a century ago by Thunberg, who regarded it as a species of Yew, it was not known in European gardens until 1860, when it was introduced by Fortune. It was first correctly described and figured by Siebold and Zuccarini in their Flora of Japan, (1834), who recognized it as a new genus, to which they gave the name *Sciadopitys*, from the Greek words for umbrella and pine-tree; on account of the peculiar arrangement of the leaves and branches, they called the species *verticillata*. Siebold, who saw the plant only in cultivation in the gardens and in the grounds around the temples, described it as growing only 12 to 15 ft. in hight, but according to later travelers it reaches from 80 to 150 feet, and is one of the grandest of all forest trees. The branches are alternate or whorled: the leaves are flat, about one-sixth of an inch wide, and about four inches long, are arranged in whorls of 30 or 40, at the ends of the branches, each whorl spreading and assuming an umbrella-like form. The leaves last three or four years, and the young branches show a succession of several such whorls separated by spaces equal to the annual growth of the stem. The male and female flowers are probably upon different branches of the same tree, the latter ripening into a cone the year after flowering; the cone are about three inches long and half as thick, cylindrical, and composed of very thick, broad scales, between which are equally broad bracts, each scare bearing six to nine seeds. None of the conifers from Japan have been watched by cultivators with more interest than this. At first it was quite too rare and costly a plant to allow its hardiness to be generally tested; we have known for several years of a specimen near Philadelphia, which has stood the winters there, but as that locality seems to be the northern limit of many things, this single case could not be taken as an indication of its behavior farther north. We were especially pleased to receive from Mr. Charles H. Hovey, of Hovey & Co., Cambridgeport, Mass., a photograph of the tree from which our engraving is made, and the following notes which seem to put the question of its hardiness beyond a doubt. Mr. Hovey writes:

"This new conifer cannot be too highly recommended, should it continue to withstand the climate as successfully as it has done in the vicinity of Boston for the last four very severe winters. We have a specimen which has stood out during that time, without the slightest protection, and it has not received the least injury to any part of its branches. Mr. Wm. Gray, jr., has also a specimen which has been out about the same time, which has also been without protection and without injury. Our plant is now about five feet high, and from its peculiar habit is noticeable among all the other conifers. It may well be a favorite with us, as it is with the Japanese, on account of its distinct and striking appearance, and now that its hardiness seems to be established, it will no doubt be generally grown."

From what we have seen of the tree we can heartily second Mr. Hovey's commendation. With most conifers, their power of endurance increases with age, and many that are hardy when well established, require protection when first planted; that this endures the winter when quite small, gives excellent promise for its future. Those who have a place for a single choice, striking evergreen, or for only a few varieties, should consider the *Sciadopitys* in making a selection. According to Siebold, the Japanese have several varieties, and the French catalogues mention one with the foliage marked with yellow blotches, but we cannot conceive this to be any improvement upon the rich green of the ordinary form, and it is too dignified a tree to indulge in any such vagaries.—*American Agriculturist.*

## A NON-HEELING BOAT.

(See page 76.)

The accompanying engraving illustrates a curious boat, exhibited at the Centennial. Its construction will be understood at a glance. The hull is hung on pivots in a heavy frame, which constitutes stern post, stem post, and keel in one. The mast is stepped in the stem. Consequently when the wind pushes the sail horizontally, the keel, &c., are alone lifted, while the boat remains perpendicular. As a curiosity in naval architecture, it is worth putting on record in our pages.

FOR an excellent mixture for the removal of ink spots and writing on paper, take of alum, amber, sulphur, saltpetre, each, in fine powder, one part; thoroughly mixed.

## THE BAKE APPLE.

(See page 85.)

The Bake Apple or Cloud Berry *(Rubus Chamæmorus)* abounds on the desolate shores of Labrador and furnishes the inhabitants with fruit which is not only agreeable, but capable of keeping during the long winter when supplies of other fruit are inaccessible. The plant has two or three imbricating leaves of a bright green color and a stem of six inches terminating in a pretty cup-shape flower of white color. The flower is succeeded by the fruit which in form resembles the strawberry, or white raspberry. When unripe it is red. In this condition it gives a distinct tinge of red to the fields; when ripe it is yellow with a flavor between a mulberry and strawberry. It is preserved as jam and jelly, and is frozen and packed away for winter. There are several other fruits on the coast, such as blueberries, dewberries, low cranberries. Without these few fruits the people who are shut out from the outer world for six months would suffer from scurvy. These plants were gathered at Bonne Esperance at the mouth of the Cariboo river, a small settlement consisting of a few families where, however, a Mission has been maintained for over twenty years by friends in Montreal. The staff consist of a minister and teacher; a small church and school-house have been built. The mercury often reaches over 40° below zero. The only vegetables that can be raised are turnips and potatoes in favorable seasons. The sea is the only certain harvest field. Notwithstanding all the vicissitudes to which they are exposed, the pleople are strong and healthy, and when circumstances compel them to leave for Canada or the States, they invariably return to their native shores as soon as chance permits.

ELASTIC DAMMAR VARNISH.—An elastic flexible varnish of paper, which may be applied without previously sizing the article, may be prepared as follows:—Crush transparent and clear pieces of dammar into small grains; introduce a convenient quantity—say 40 grains—into a flask, pour on it about six ounces of acetone, and expose the whole to a moderate temperature for about two weeks, frequently shaking. At the end of this time pour off the clear saturated solution of dammarin acetone, and add to every four parts of varnish three parts of rather dense collodion; the two solutions are mixed by agitation, the resulting liquid allowed to settle, and preserved in well-closed phials. This varnish is applied by means of a soft beaver-hair pencil, in vertical lines. At the first application it will appear as if the surface of the paper were covered with a thin white skin. As soon, however, as the varnish has become dry, it presents a clear shining surface. It should be applied in two or three layers. This varnish retains its gloss under all conditions of weather, and remains elastic.

DON'T WORRY ABOUT YOURSELF.—The *Journal of Health* says:—To regain or recover health persons should be relieved from anxiety concerning diseases. The mind has power over the body. For a person to think he has a disease will often produce that disease. This we see effected when the mind is intensely concentrated upon the disease of another. It is found in the hospitals that physicians and surgeons who make a specialty of a certain disease are liable to die of it themselves; and the mental power is so great that sometimes people die of diseases which they only have in imagination. We have seen persons sea-sick in anticipation of a voyage, before reaching the vessel. We have known a person to die of a cancer in the stomach when he had no cancer, nor any other disease. A man blindfolded and slightly pricked in the arm, has fainted and died from believing that he was bleeding to death. Therefore, persons in health, and desiring to continue so, should at all times be cheerful and happy, and those who are sick should have their attention drawn as much as possible from themselves. It is by their faith men are saved, and also by their faith that they die. If a man wills not to die he can live in spite of disease; and if he has little or no attachment to life, he will slip away as easily as a child falls asleep. Men live by their souls and not by their bodies. Their bodies have no life of themselves; they are only resources of life—tenements of their souls. The will has much to do in continuing the physical occupancy or giving it up.

A BEAUTIFUL SENTIMENT.—Sorrow sobers us and makes the mind genial. And in sorrow we love and trust our friends more tenderly, and the dead become dearer to us, and just as the stars shine out in the night, so there are blessed faces that look at us in our grief, though their features were fading our recollection.

## LADIES' FANCY-WORK.

(See page 88.)

No. 1.—Work-Table.

Of fine wicker-work, ornamented with wool embroidery, and raised wool flowers. The basket is also trimmed with silk cord and tassels.

No. 2.—Work-Stand.

The foundation is of black-and-gold bamboo, fitted and lined with blue quilted satin; the cover is of blue satin, embroidered with coloured silks, and edged with a ruching of ribbon.

No. 3.—Crochet: Edging.

1st. Row: Make a chain the length required.

2nd. Row: One treble separated by one chain into each of three alternate stitches of the chain, nine chain, one roll picot into the fifth (a roll picot is worked thus: twist the cotton six times round the hook, insert the hook into the loop indicated, and draw through all the loops on the hook together), nine chain, one roll picot into the sixth, one single into the fifth of first nine chain, four chain, one roll picot into the first of four chain, nine chain, one roll picot into the fifth, one single into top of last worked single, five chain, one roll picot into first, nine chain, one roll picot into fifth, one single into top of last worked single, one double into each of next four successive chains, pass over one stitch of first row, one treble separated by one chain into each of three next alternate stitches of first row, three chain, one single into third of last worked nine chain, three chain, one double into the top of last treble, pass over one stitch of first row. Repeat from the beginning of the row.

No. 4.—Edging: Mignardise and Crochet.

1st. Row: Take a length of mignardise, and work one single separated by one chain into each of five picots of mignardise, ten chain, pass over two picots. Repeat for the length required.

2nd. Row: One treble into first of ten chain, two chain, pass over one chain. Repeat from * five times more. Two chain, pass over three of first worked singles, one treble into each of three next successive stitches, two chain. Repeat from the beginning of the row.

3rd. Row: One single under first two chain of previous row, four chain. Repeat from * twice more. One single under next two chain, five chain, one single under same chain, * four chain, one single under next two chain. Repeat from * twice more. One single into each of three treble of previous row. Repeat from the beginning of the row.

For the heading, work one single separated by one chain into each successive picot of mignardise.

No. 5.—Edging: Crochet and Mignardise.

For the inside of scallops, take a length of mignardise, and work one single separated by two chain into each of two successive picots, thirteen chain, pass over one picot of mignardise, one single into each of next seven successive picots, thirteen chain, pass over one picot. Repeat throughout the row.

The heading is worked in cross trebles. For this put the cotton round the hook as for a double-treble; work off the lower loop, as for a treble, leaving the remaining loops on the hook, pass over one stitch of last row, one treble into the next; work off the remaining loops of the double-treble, one chain, one treble into centre loop of last double-treble, one chain. Repeat.

For the edge, one single into a picot of mignardise, three chain, one single into next picot, five chain, one single into second of five chain, one chain, one single into next picot. Repeat from three times more. Three chain, one single into next picot, one chain, pass over four picots. Repeat from the beginning of the row.

No. 6.—Pen-Wiper.

A butterfly is a rather pretty "shape for a pen-wiper." Cut two pieces of black cloth the shape of figure 1, but about twice as large. Button-hole one piece around the edge with yellow silk or worsted. (This keeps it in good shape.) Work yellow dots all round the edge, and the six dots in the centre of the lower wings blue. Cut half dozen pieces of black silk (or muslin) a little smaller than the pattern, to put between the pieces of cloth. Chain-stitch the lines between the upper and lower wings with red. Roll up a small piece of black velvet (black cloth will do), and fasten it on to the worked piece by red worsted, sewed over and over. Before sewing the body into place, put all the pieces together where they belong, and fasten them all in place by sewing on the body. Sew two black beads on the head, for eyes, and draw a piece of waxed black silk through the head for the long feelers or antennæ.

No. 7.—A Shaving Paper Case.

Cut two pieces of card-board any shape you choose; paste a piece of gilt (or other ornamental) paper around the edge, stick your picture in the centre, cut a number of thin papers a little smaller than the case and fasten all together with a fine string. Ornament with a bow of ribbon.

## TYPHOID FEVER.

A. L. Loomis, M.D., in the *Medical Record*, says: It is difficult to determine the period of incubation, or length of time the poison must remain in the body before symptoms of the disease are manifest. The history of isolated cases would lead to the conclusion that the period varies from 14 to 20 days.

The next question that arises is, how does the typhoid poison gain admission to the human body? Undoubtedly there are two principal sources of infection, namely, the air we breathe and the water we drink. A large number of well authenticated histories have now established the fact, that this fever may be developed by gases which emanate from privies, sewers, &c., which have been the receptacle of excrement from typhoid patients, and also by drinking water from springs and wells which have become contaminated by matters from adjoining privies and cesspools. It is also now an accepted belief, or rather is regarded as an established fact, that water remains contaminated, though far remote from the point where it came in contact with a defective sewer or water-closet.

Soil pipes and sewerage may be defective for a long time, perhaps a year, or even longer, and no case of typhoid fever occur, when suddenly an endemic of typhoid fever breaks out, and careful investigation shows that its development was preceded by the introduction of the excrement of a single individual sick with the disease.

It is the belief of some that milk can convey the typhoid poison, and there is evidence in favor of this opinion; but I think there is stronger evidence that the water in the milk, and not the milk itself, is the medium through which the poison is transmitted.

This poison has great vitality. Typhoid fever frequently occurs in the same locality year after year, when the surrounding conditions are favorable to its development. Those conditions which favor its development are more frequently present in the autumn than at any other season of the year, and for this reason it has been called autumnal fever.

Usually it makes its appearance in a locality, year after year, at about the same time; case after case is developed until entire households and neighbourhoods become its victims. Individuals who come to care for the sick may contract the disease, and even persons who visit houses in which the disease is prevailing may afterwards develop the fever, contracting it, not from the sick, but from the infected atmosphere of the locality.

Age must be regarded as a predisposing cause of typhoid fever. It is much more likely to occur in young than in old persons. It occurs most frequently between the ages of 15 and 25, and is rarely met with in persons over 50.

There are also individual idiosyncrasies which seem to predispose to this fever. Some contract it upon the slightest exposure to the influence of the poison, while others, frequently brought in contact with it, through long endemics, escape. Again, an individual may have repeated attacks of typhoid fever. I have in mind a physician who had typhoid fever four times, the last attack proving fatal. A person who has had typhus or scarlet fever is not likely to have a second attack, but no such immunity follows an attack of typhoid fever. Whatever view we take of the exact nature of the typhoid poison, it has been quite conclusively demonstrated that the typhoid poison differs very essentially from that of other fevers.

From this brief review of the etiology of this fever, we are led to the following conclusions:

First.—That its development is independent of over-crowding, and that it attacks the rich and poor indiscriminately.

Second.—That it may be communicated from one person to another through the excrements which have undergone decomposition after their discharge.

Third.—That an endemic of typhoid fever only occurs where the air or drinking water of the locality has become poisoned by emanations from typhoid excrements which have undergone decomposition, and that, if the fever becomes epidemic, it is a circumscribed epidemic, and not widespread.

Fourth.—That the exact nature of the typhoid fever poison is still unknown.

## LADIES' FANCY WORK

FIG. 1. WORK TABLE.

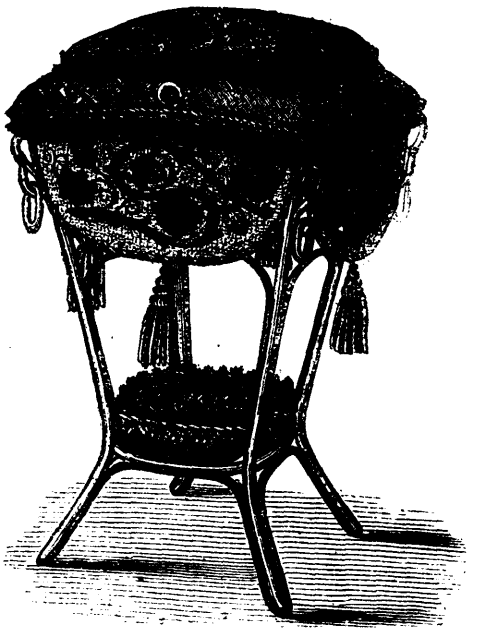


FIG. 2. WORK TABLE.

FIG. 3

FIG. 4.

EDGING CROCHET AND MIGNARDISE.

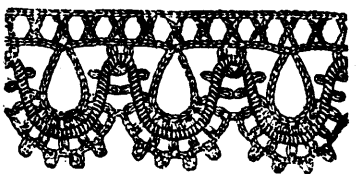


FIG. 5.

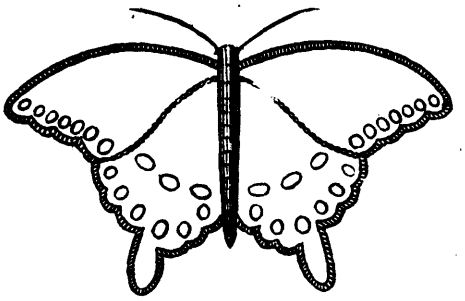


FIG. 6.

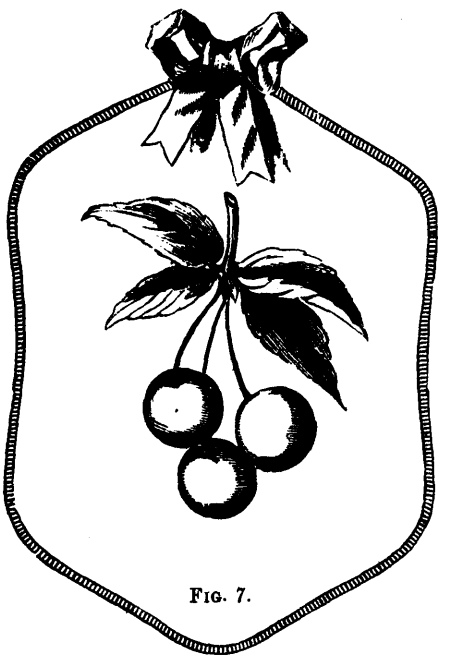


FIG. 7.

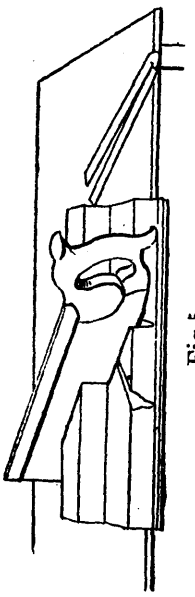


Fig.5

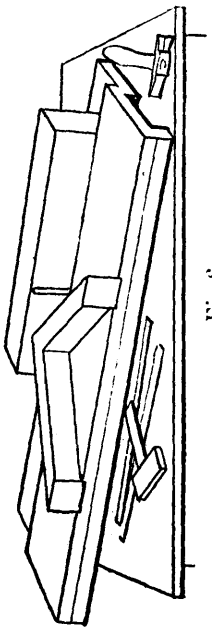


Fig.6

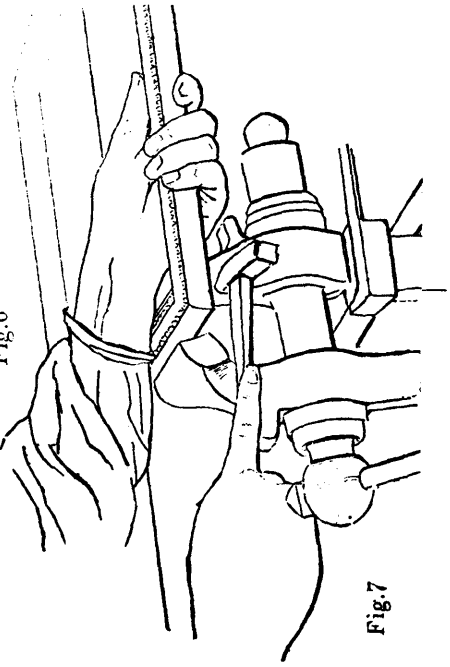
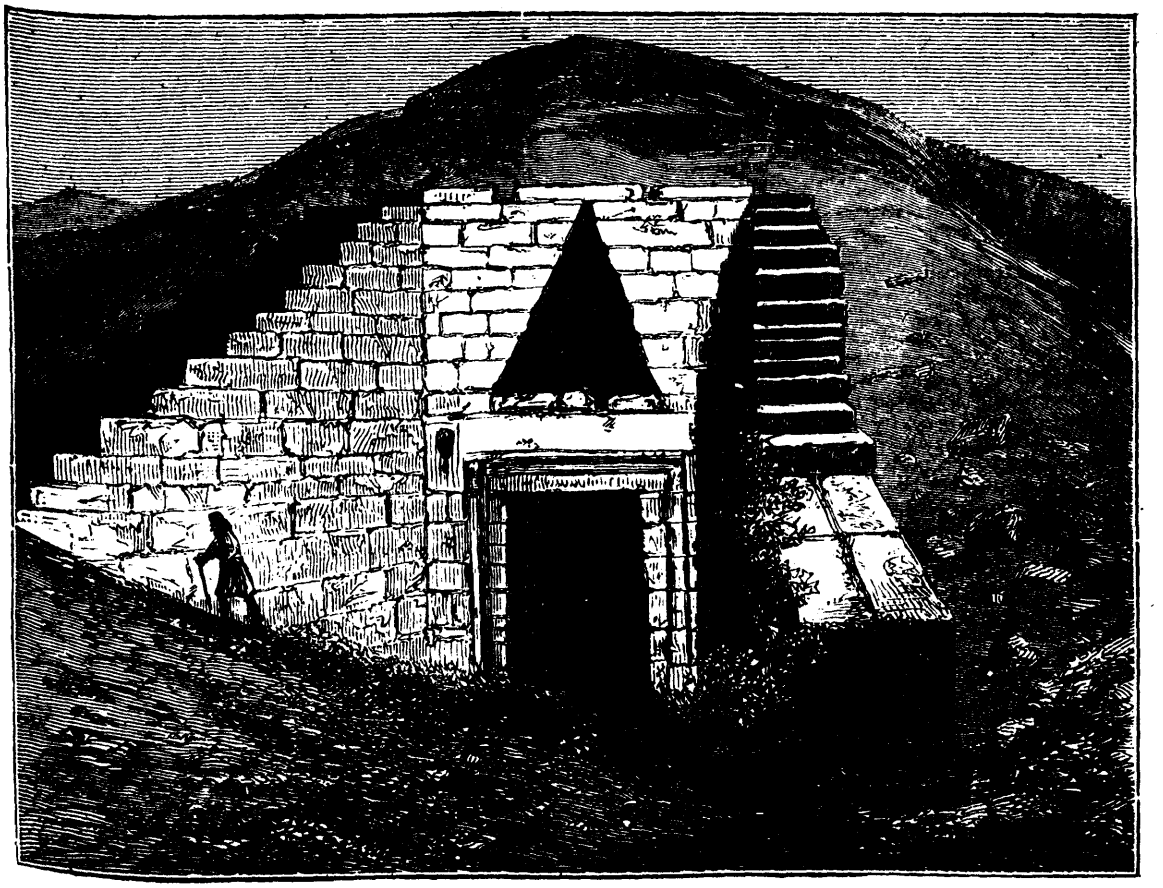


Fig.7

MITREING PICTURE FRAMES.



TREASURY OR TOMB OF AGAMEMNON, MYCENÆ.

## MITREING PICTURE FRAMES.

(See page 89.)

TOOLS REQUIRED.

The following tools will be required, which will not be costly, and may easily be obtained, while, with the assistance of the engravings, the amateur may be enabled to manufacture the mitre block and shooting board himself.

*Mitre Block.*—This block is made to guide the saw in cutting up mouldings. It consists of a thick piece of wood glued on a good bottom, with saw cuts in it at an angle of 45 degrees, so that the moulding, when cut off, will form a square frame. Eighteen inches long will be found a convenient length. See Fig. 5.

*Shooting Board.*—This board is made with a ledge screwed on at an angle of 45 degrees, and a flat run for the plain laid on its side. The use of the shooting board is to "shoot" or plane the ends of the mouldings to bring the mitres close together. See Fig. 6.

*Shooting Planes.*—Planes about 15 inches long, and 3¼ wide, without handles, the plain iron without a guard, used for shooting the ends of the mouldings on the shooting board.

*Saws.*—Those used for cutting up mouldings are called tenon or back saws, and are supported at the back by a piece of brass or iron to prevent the thin blade of the saw from bending.

*Hammers*, various sizes, and not too heavy.

*Chisels*, different widths; *Brad-awls* and *Gimlets*, various sizes.

*Turnscrews*, large and small.

In addition to which a few small tools, such as pincers, sissors, punches, squares, &c.

There must also be cut brands, from half-an-inch to three inches, long, picture rings of all sizes, nails, screws, &c.

*Glue* will be required in joining the frames, and the amatner should get a glue pot, and use some of the best glue, which may be known by its transparency. Break up the glue into small pieces, and fill the pot, cover the whole with water the overnight, and in the morning with plenty of water in the under pot; let it boil gently, occasionally stirring. When ready, if too thick, it can easily be thinned by adding a little water.

The mouldings in use are maple O. O. G., two or three widths German mouldings, and mouldings made from oak, mahogany, and other wood; the gilder also uses mouldings in the white. We will select a three-quarter-inch bead and flat German moulding, and make a frame for the amateur's instruction.

By the following method the amateur will be able to succeed in producing some creditable work, although this method is not in use in shops where large numbers are made.

With the saw and mitre block before him, the amateur will take a length of the moulding and cut off the end the right way of the mitre, and if the "sight measure" of the frame in hand is 14 inches by 18, measure off at the sight edge of the moulding 18 inches, and cut it off about one-sixteenth longer to allow for "shooting," next, cut the end off the moulding previous to measuring for the next bar; measure fourteen inches, and cut off a little longer as before, and in the same way for the two remaining bars of the frame.

The next operation will be to "shoot," as is technically called, the ends of moulding so as to make it fit close. The plane must have a good edge, and not too much "set," and laid on its side on the shooting board, as seen in the engraving. Take a piece of the moulding and lay it on the board, keeping it firm and on to the plane iron by the left hand, while the right works plane. Three or four strokes are usually sufficient to give a clean edge and surface to the end of the moulding. Proceed in this way till the eight ends are all smooth, when the frame is ready to be put together.

Have four corners ready made. Lay the four pieces of mould. ing together, and place the corners at the mitres, and with a piece of medium size string, tie it round. It will not be required to be very tight. Then insert a slip of deal in the cord and twist it round two or three times and let the slip rest on the frame.

The engraving will better explain itthan any description could do.

By this method almost any amount of pressure can be given to the four mitres, and it can be seen at a glance if either of the mitres could be improved by taking a shaving off at the shooting board. If the mires are satisfactory take out theslip of d eal from the string when the frame will be loose enough to take out out of the bars. Glue them with thin glue both ends, and again insert the piece, and also the bar on the opposite side of the same. Insert the slip of wood as before in the string, and give it one turn. You can now set the mitres of the frame to an hair's breadth. Give the slip of wood another turn or two, and the frame will be out nearly together. Sometimes the frame will twist, that is one corner will be higher than another; this can be easily remedied by rising the string on one corner and lowering on the opposite, when the frame will be found in its place. When the glue is dry take off the corners and string, and with a fine saw make a kerf in each corner at the back edge, and glue in four slips of veneers as keys. When dry cut off the slips of wood and the frame will be strongly put together, and will be finished so far.

This method takes a little more time than that practised in frame shops, but to an ameteur he will be sure of success every step he takes.

Larger and heavier frames can be made in the same way by using stouter corners and string.

## ETCHING ON GLASS.

SINCE fluoric preparations have been produced at reasonable prices, the decoration of glass by their means has steadily made its way. Etched glass is now to be found everywhere, and glass etching runs glass-cutting very hard. As it is well known, fluoric acid usually etches smoothly, while other fluoric preparations yield a matt surface. The most beautiful ornamentation is obtained when certain parts of the glass surface are rendered matt by means of fluoride of ammonium which has been slightly acidified by means of acetic acid. The matt appearance is not always the same with different kinds of glass, but varies much in beauty; this effect is governed by the composition of the glass, lead glasses being easily acted upon, and furnish a very fine matt surface. According to the *Photographisches Archiv*, where it is desired to have the surface of the glass not altogether matt, but shining like ice, as in the case of window glass, this may be attained in a simple manner by placing the plate in a perfectly horizontal position and covering it with fine groats. Then very dilute fluoric acid is poured upon it. The groats act as a shield, and produce upon the glass raised points. Several ways exist of etching photographs on glass. A good result may be secured by covering the surface with a solution of gum, made sensitive with bichromate of potash, and printing the same under a negative; after the image has been thus produced, it is dusted over with minium or red lead, and the red picture thus obtained is fixed and burnt in the usual manner. The easily soluble red glass, so obtained, is treated with strong sulphuric acid, when a white matt is produced, and the picture appears by transmitted light as a positive.

## THE DANGER IN KEROSENE OIL.

The *Polytechnic Review* gives an article on the danger in kerosene oil as used in households, and tells how the quality may be tested:

It is simply to be set down to good fortune if one who has employed the light oils for household purposes has escaped injury, since no amount of care can avail against the inevitable result which must follow an accident. It is easy to understand how persons ignorant of the highly dangerous character of the light petroleums may unknowingly make use of them in the manner above named; but it is really a matter of concern and surprise that so many, even of those who are thoroughly aware of the nature of the incendiary they are introducing into their households, are nevertheless thoughtless or indifferent enough to continue the suicidal practice—for no term can be too strong to properly characterize the fearful nature of the risk one is constanly running while employing these oils in the household.

There seems to exist a notion that the explosive or inflammable properties of the light petroleums can be effectually neutralized by adding various substances to them. The Patent Office Records for the past few years contain numbers of claims for such mixtures of naphtha or gasolene with a great variety of substances too numerous to mention.

Whether or not the inventors of these recipes really have faith in the claims they present is a matter of small importance; but the deceptive illustrations which they are able to offer in vindication of their assertions, no less than the attractive names which they attach to their incendiary mixtures, are the sources of many distressing calamities.

There is one simple and, for practical purposes, satisfactory method of determining the character of all such mixtures, and which applies equally as well to the common oils. Let a few drops be poured into a saucer, apply a match; if the material

burns, reject it as unsafe. The fact that the material can be set on fire at the ordinary temperature of our dwellings should be a sufficient evidence to a person of ordinary intelligence that when employed in the household it may, at the first thoughtless or careless act, become the cause of a frightful accident.

Now for the reason why these dangerous oils find their way into the market in defiance of legal prohibition.

The crude petroleum, as it comes from the wells, is not a simple substance, but consists of a mixture of a number of oils. The operation of refining the crude product consists essentially in subjecting it to a system of frictional distillation, whereby it is separated into some six or seven products to which the commercial names of rhigolene, gasoline, naphtha, benzine, kerosene, etc., are attached.

The benzine or naphtha makes generally about 15 to 20 per cent. of the crude oil, and for this demand in the various industrial arts is by no means equal to the supply, in consequence of which it commands but an inferior price in the market: in fact, considerably less than that demanded for the burning oils proper. Here, then, exists a direct temptation to dishonest or ignorant manufacturers and dealers to adulterate their stock of burning oil with oils of inferior price and dangerous quality. To what extent this reckless practice is carried on, the community have no just conception, but the writer feels safe in asserting that it is as general as any of the trade adulterations.

So general has it been practiced, in Phildelphia at least, that only three years ago an examination of 3,000 oil samples sold in the various parts of the city and its suburbs, showed that not more than one-twelfth of one per cent. of all the burning oils sold in the shops of this city were of sufficiently high grade to pass the fire test; and it may be added that there is no reason to suppose that any improvement of this condition of things has taken place since the time when the examination was made. The constant occurence, therefore, of accidents with coal oil—so long as the cheap and highly dangerous products of the refinery are indiscriminately used to adulterate the comparatively safe burning oil, the kerosene, or doctored, with equal impunity into the numberless burning mixtures with alluring names that meet one at every turn—is a perfectly natural result, and one that should occasion no surprise. And so long as inspection is a farce, and the inspector and vendor are beyond the pale of legal accountability for their deeds of omission and commission, just so long will coal oil murders and disasters continue to be deplored.

## DYSPEPSIA.

The nervous energy is the motive power of the whole man, spiritual, mental and physical. When that power is equally distributed the body is well, the brain is clear and the heart is buoyant. If the brain has more than its share, it burns itself up, and makes the "lean Cassius,"—the restless body and the anxious countenance.

As there is a given quantity of nervous influence for the whole body, if the brain has more than its natural portion, the stomach has less, consequently the food is not throughly assimilated, or, as we call it, "digested." This being the case, the requisite amount of nutriment is not derived from the food, and the whole body suffers, doubly suffers; for not only is the supply of nutriment deficient, but the quality is imperfect. These things go on, aggravating each other, until there is not a sound spot in the whole body; the whole machinery of the man is by turns the seat of some ache or pain, or "symptom." This is a common form of aggravated dyspepsia.

Such being the facts, some useful practical lessons may be learned.

1. Never sit down to a table with an anxious or disturbed mind; better a hundred-fold intermit that meal, for there will then be much more food in the world for hungrier stomachs than yours; and besides, eating under such circumstances can only, and will always prolong and aggravate the condition of things.

2. Never sit down to a meal after any intense mental effort, for physical and mental injury is sure to follow, and no man has a right deliberately to injure body, mind or estate.

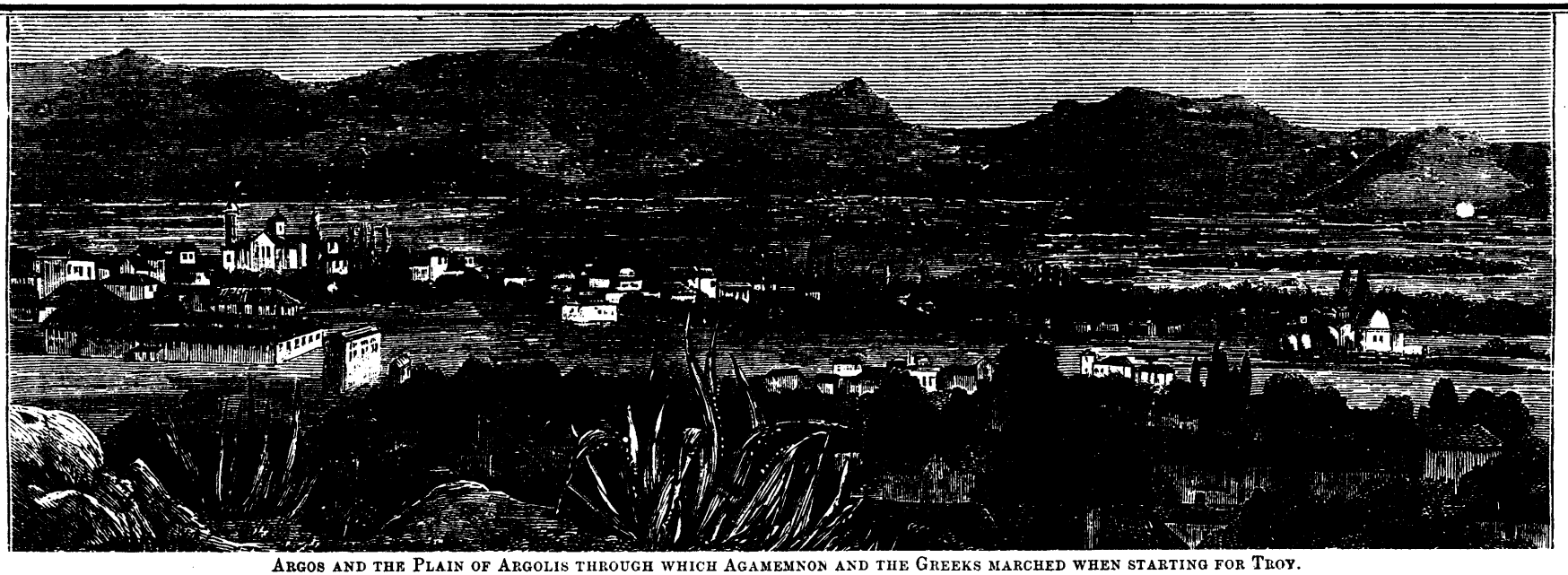
3. Never go to a full table during bodily exhaustion; designated by some as being worn out, tired to death, used up, done over and the like. The wisest thing you can do under such circumstances is to take a cracker and a cup of warm tea, either black or green, and no more. In ten minutes you will feel a degree of refreshment and liveliness which will be pleasantly surprising to you; not of the transient kind, which a glass of liquor affords, but permanent, for the tea gives present stimulus and a little strength, and before it subsides, nutriment begins to be advised a second time, who will make a trial as above, while it is a fact of no unusual observation among intelligent physicians, that eating heartily, under bodily exhaustion, is not an unfrequent cause of alarming and painful illness, and sometimes of sudden death. These things being so, let every family make it a point to assemble round the family board with kindly feelings, with a cheerful humor and a courteous spirit; and let that member be sent from the table in disgrace, who presumes to mar the ought-to-be blest reunion, by sullen silence, or impatient look, or angry tone, or complaining tongue. Eat in thankful gladness, or away with you to the kitchen, you graceless shurl, you ungrateful, pestilent lout that you are. There was grand and good philosophy in the old time custom of having a buffoon, or music at the dinner table.—*Hall's Journal of Health.*

DIPHTHERIA SUCCESSFULLY TREATED. — Dr. E. Chenery, M.D., Boston, Mass., cites a very large number of cases, 158 within his own practice, saved by the use of hyposulphite of soda. The dose of the hyposulphite is from five to 15 grains or more in syrup, every two or three hours, according to age and circumstances. It can do no harm, but if too much is given it will physic. As much as the patient can bear without physicking is a good rule in the severer cases. The tincture can be used in doses of five drops to a half drachm in milk. The amount for thorough stimulation is greater than can be taken in water. I usually give it in such doses as can be easily taken in milk, using the milk as food for small children. One fact, however, needs to be borne in mind, namely, the hyposulphite prevents the digestion of milk, and should not be given in less than hour from it. They may be used alternately, however, without interference, in sufficiently frequent doses. Judging in this disease as I judge in others, I am fully persuaded that the treatment I have so long used, and which has not failed me yet, will save nearly every case of diphtheria if seasonably and vigorously employed, and there is no reason why it should not do as well in the hands of others as in my own. In none of my cases have I used any alcohol.

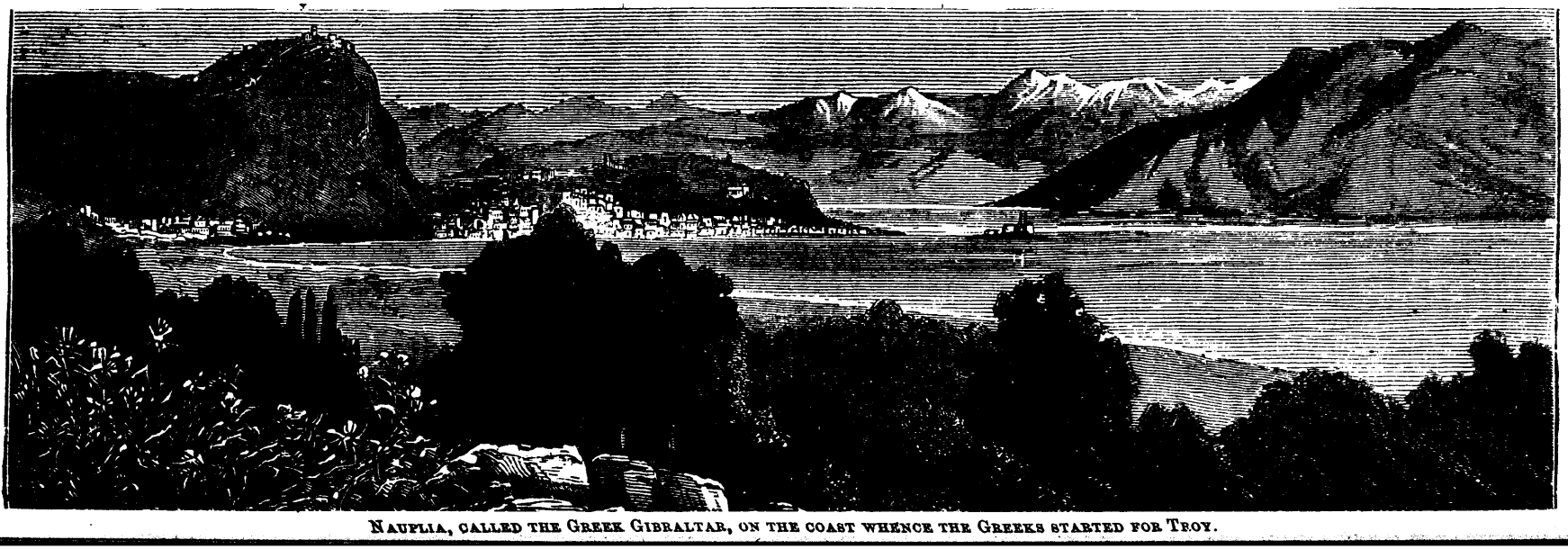
VARNISH FOR CANE AND BASKET WORK.—According to the *Hessisches Gewerbeblatt*, lac, prepared after the following recipe, is used to cover split and colored cane: 25 grains of good linseed oil are heated in a sand bath, as long as a drop of it, poured on a cold stone, does not run when the stone is inclined, and when touched with the finger it feels thready. Then are added, first in small portions, one pound fat copal varnish, or some other fat varnish. The heating of the linseed oil must not be carried too far, because otherwise it would not be completely dissolved in the copal varnish, and the vessel wherein the copal varnish is heated must be large, because by the addition of the linseed oil a great deal of frothing takes place. When cold, the required consistence is given to the varnish, by mixing it with turpentine oil. It soon dries, preserves a sufficient elasticity, and may be applied with or without addition of colors.—*Stummer's Ingenieur.*

AMUSING AND INSTRUCTIVE.—Scroll and fret-sawing and wood-carving have attained great popularity in this country in the past few years as sources of amusement and occupation for amateurs. The development of this taste has led to the introduction of many machines and devices for simplifying the labor performed and beautifying the work. There have been many books written to guide and instruct the amateur, but none so generally profitable as the little treatise by Arthur Hope on Sorrenth and inlaid work. It shows how to use the saw properly, what woods to choose and how to choose them, how woods are prepared, and how the work can best be put together. It contains a number of tasteful designs, and is altogether the best book that can be placed in the hands of the amateur beginner in scroll-sawing. Even to those who have made considerable progress in the art it is worth many times its cost. It is practical, plain, and simple, and of help in many ways. It is published by John Wilkinson, Chicago.

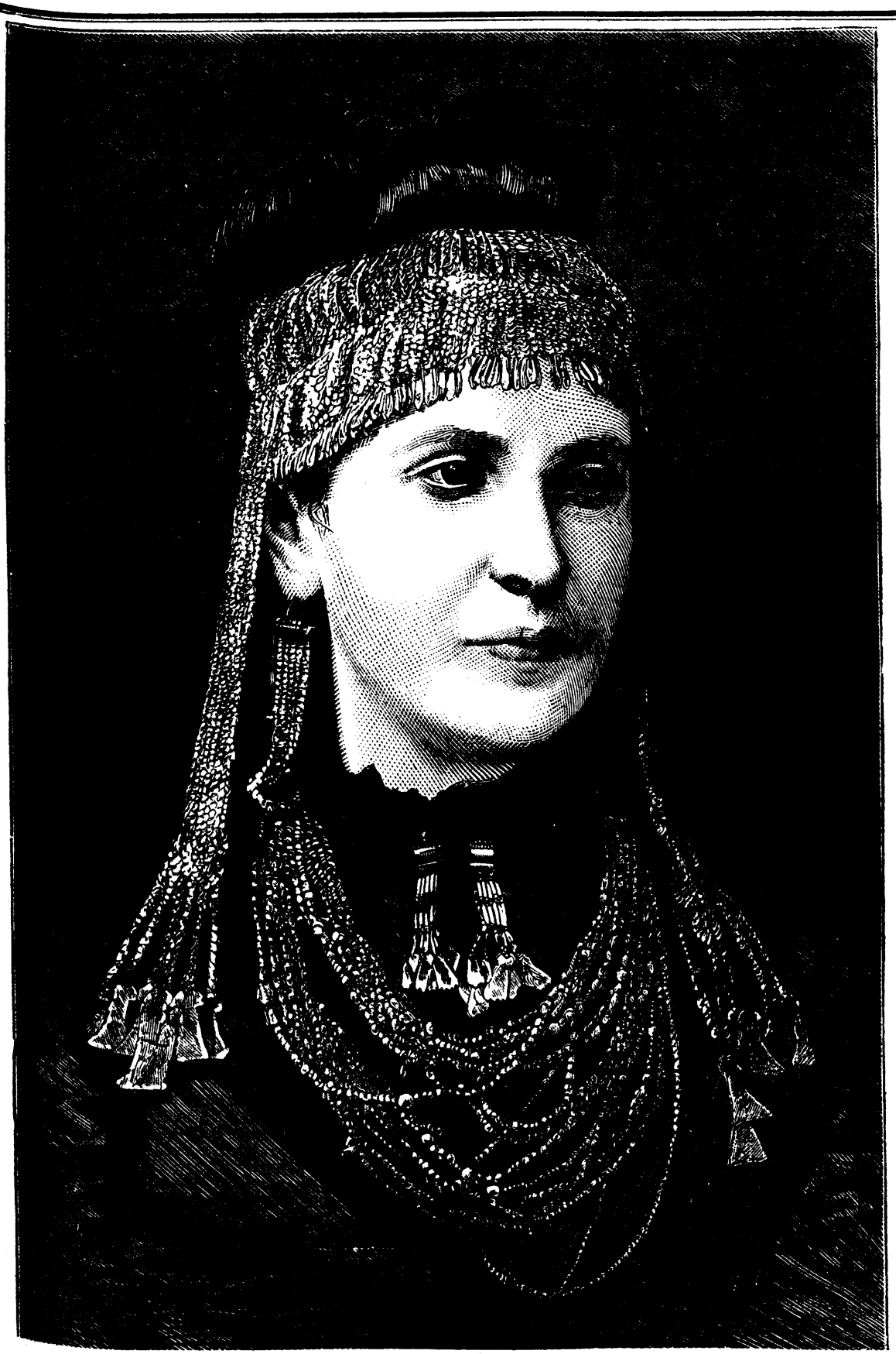
GOOD ADVICE.—It is much better to tread the path of life cheerfully skipping lightly over the thorns and briars that obstruct your way, then to sit down under every hedge lamenting your hard fate. The thread of a cheerful man's life spins out much longer than that of a man who is continually sad and despondinp Prudent conduct in the concerns of life is highly necessary —but if distress succeed, dejection and dispair will not afford relief. The best thing to be done when evil comes upon us is not lamentation, but action; not to sit and suffer, but to rise and seek the remedy.



ARGOS AND THE PLAIN OF ARGOLIS THROUGH WHICH AGAMEMNON AND THE GREEKS MARCHED WHEN STARTING FOR TROY.



NAUPLIA, CALLED THE GREEK GIBRALTAR, ON THE COAST WHENCE THE GREEKS STARTED FOR TROY.



MADAME SCHLIEMANN IN THE PARURE OF HELEN OF TROY.

## TREASURE TROVE.

TREASURE TROVE AT MYCENÆ.—Some remarkable discoveries have been made by Mr. Schliemann at Mycenæ, an ancient city in Greece, chiefly among the tomb on the Acropolis.

A correspondent of the *Times* at Argos (from which Mycenæ is distant about five miles), telegraphing on Nov. 24, reports:—"In the great circle of parallel slabs beneath the archaic sepulchral stones, considered by Pausanias. following tradition, as the tombs of Atreus, Agamemnon, Cassandra, Eurymedon, and their companions, Dr. Schliemann has discovered immense tombs containing jewellery. He found, yesterday, in one portion of a tomb human bones, male and female, plate, jewellery of pure archaic gold weighing five kilogrammes, two sceptres with heads of crystal and chased objects in silver and bronze. It is impossible to describe the rich variety of the treasure."

The same correspondent telegraphs that "Dr. Schliemann has found in the tomb already referred to another great quantity of woman's jewellery in gold, and handsomely worked. Immediately after begining excavation at an adjoining tomb a large head of a cow in silver with immense horns of pure gold, was found. All these objects were marvellously worked. Among other discoveries are nine silver vases and numerous swords of bronze."

By another telegram we learn that on Nov. 28 "Dr: Schliemann, continuing his researches in the tombs already described, found, yesterday, the following articles of pure gold, splendidly ornamented:—A helmet, two diadems, a woman's large comb, a large breastplate, three masks, six vases, two bracelets, two rings, three brooches, an immense mass of buttons, leaves, and other articles, three large girdles, a silver vase, a stag cast in lead, with a mass of swords, daggers, axes, and warriors' knives, all of bronze with twenty-five flint-headed arrows."

The *Times* publishes the following telegram from Argos, dated Dec. 2:—"In the tomb previously referred to Dr. Schliemann has discovered a large golden mask and an enormous breastplate of gold. He also found the body of a man, wonderfully preserved, especially the face. The head was round, the eyes large, and the mouth contained thirty-two fine teeth. There is, however, a difficulty about preserving the remains. There were also found fifteen bronze swords with great golden hilts—a mass of immense golden buttons, splendidly engraved, ornamented the sheaths of the swords also two great golden goblets, and a great quantity of other objects in gold, articles in earthenware carved wooden box, several articles in chased crystal, ten large cooking utensils of bronze, but no traces of anything in iron or glass."

A telegram from Athens to the same journal, dated Dec. 5, states that "Dr. Schliemann has succeeded in preserving the dead body of the man to which reference was made in a previous telegram. There were found on his right three large splendidly ornamented golden goblets, one alabaster goblet, two silver goblets, 134 richly ornamented large golden buttons, four golden sword-handles, eleven bronze swords and jewels."

The *London Graphic* also gives the notice of Dr. and Madame Schliemann.

A POLYCHROME anique mosaic has been discovered at Sens, France, which is of great beauty, and representing two stags face to face, with a vase between them, and in a fine style, decorated with leaves on which the stags appear to browse. The whole is enclosed by a border of leaves of the laurel, aud fruits harmoniously disposed.

Another paper alluding to the subject remarks:

The dragon which of yore guarded hidden treasures must be dead. In no previous period have the hoards of antiquity been so freely rendered up to antiquarian enterprise. General di Cesnola's former finds in Cyprus have been completely cast into the shade by the last, and Dr. Schliemann has been rifling the tombs of the Atridæ to good purpose at Mycenæ. Dr. Schliemann's discovery is less important from the intrinsic value of the metal ornaments found than from their age and the beauty of their design. The historic eminence of the supposed dead, also, in this case lends an additional element of interest to the discovery. The skeletons and ornaments were found at a depth of only about nine inches from the surface. It is wonderful that they were not sooner turned up; but superstition during the classical period and ignorance afterwards have apparently protected them. The Assyrian excavations and those at Budrum, and recently at Olympia, as well as those in Cyrus, have been conducted by men who are guided in their researches by more accurate knowledge than their predecessors in the same work. Owing to portions of the Chesil Beach at Portland, where two of the Armada treasure galleons sunk, having been displaced by the recent storms, searchers have been busy in the underlying silt, and a bar of silver, about three pounds in weight, has been found. As respects the raising of the precious metals from their native beds, the last returns show a steady yield both in America and Australia, three-fourths of the produce of both countries being derived from auriferous lodes in the quartz. One of the strangest stories ever told in connection with mining is being buzzed about Oregon. It tells of nothing less than acres of boiling springs, from which, instead of water, pour out streams of chloride of silver. Shiploads of precious metal are represented to be in sight, in the shape of a soapy grey substance, somewhat resembling quicksilver. "The molten masses bubble and boil with escaping gases. The substance is so heavy that a stone will not sink in it, but a stick or crowbar may be forced down into these pools of wealth several feet, when the immense gravity of the mass will throw it back into the air like an arrow shot from an Indian's bow. At least 160 acres are covered with these springs, ranging from a few feet to 100 yards across. Each one is surrounded with a rim of crystallised silver. Their depth is unknown." The mineral wealth of these western States is trifling compared with the wealth of imagination possessed by their citizens.

PREHISTORIC JEWELS.—Dr. Schliemann, in a letter addressed from Athens, incidentally alluding to the valuable discoveries made by him at Mycenæ, says:—"The mass of jewels is so great that you can fill with them a large museum. But what makes these jewels particularly precious is that they derive from the mythic heroic age, of which no museum has possessed as yet a single fragment of pottery."

### CURE FOR HICCOUGHS AND COLDS.

We copy the following from a contemporary:

EDITORS PRESS:—Having seen your clipped article, credited to Pottsville *Miners' Journal*, entitled "Hiccoughing to Death," I deem it a boon that price will not measure or gratitude fathom in the breast of the afflicted sufferer, when he is informed that "verartria" powder, when agitated in a vial and the stopper removed, and the dust thus raised smelled up into the nostrils, so that he will not hiccough another single time after so inhaling the powder through the nose.

Nothing can possibly be a more perfect success than the effect of the above remedy. "Verartria" is a salt chemically produced from the medicinal herb, white hellebore. I would say that "verartria," used in the same way, is beneficially employed in colds, where the nostrils are closed or where the eyes are rendered heavy by a stoppage of the lachrymal or tear ducts, and also produces sneezing, which is nature's simplest remedy to clear the organs of the head when oppressed by a sluggish action of the emunctories of the part. We have seen a case of 80 hours' constant distress and many other more ordinary cases of hiccoughs cured as above stated. It can be procured at any drug store.

EMORY L. WILDARD, M. D.

S. F., Dec. 9th, 1876.

THE ALLIGATOR BUSINESS.—Between 17,000 and 20,000 alligator skins are tanned yearly, which are consumed by boot and shoe manufacturers in every portion of the United States, as well as exported to London and Hamburg. The alligators formerly came almost entirely from Louisiana, and New Orleans was the great center of the business. The Florida swamps and morasses are now the harvest fields, and Jacksonville, in that State, the great depot. The alligators often attain a lenghth of 18 to 20 feet, and frequently live to an old age. The hides are stripped off, and the belly and sides, the only portions fit for use, are packed in barrels, in strong brine and shipped to the Northern tanner, who keeps them under treatment from six to eight months, when they are ready to be cut up. So far the leather has been mainly used in the manufacture of boots and shoes, but handsome slippers are also made of it.

TO TRANSFER PRINTS, ETC., TO GLASS OR WOOD.—Take of gqm sandarach, 4 oz; mastic, 1 oz; Venice turnentine, 1 oz; alchohol 15 oz. Digest in a bottle, frequently shaking, and it is ready for use. Directions; use, if possible, good plate glass of the size of the picture to be transferred, go over it with the above varnish, beginning at one side, press down the picture firmly and evenly as you proceed, so that no air can pnssibly lodge between put aside, and let dry perfectlp, then moisten the paper cautionally with water, and remove it piecemeal by rubbing carefully with the ûngers; if managed nicely, a complhte transfix of the picture to the geass will be effected.

## DOMESTIC.

HOT LOBSTER.—One lobster, 2 oz. butter, grated nutmeg; salt; pepper, and pounded mace to taste; bread-crumbs, two eggs. Pound the meat of the lobster to a smooth paste with the butter and seasoning, and add a few bread-crumbs. Beat the eggs, and make the whole mixture into the form of a lobster; pound the spawn, and sprinkle over it. Bake a quarter of an hour, and just before serving, lay over it the tail and body shell, with the small claws underneath, to resemble a lobster.

BOILED ONIONS.—Peel them, and boil them in equal parts of milk and water. When they are tender, take them up, drain them, and add salt, pepper, and butter to the taste. Do not put salt in the water they are boiled in, as that will curdle the milk, and cause a scum to settle on the onions.

SAVOURY DISH.—Melt ¼ lb. good cheese in the oven; add half pint of broth or stock, pepper and salt to taste, a piece of ham or bacon, minced small, a little Worcester sauce, a sprig of thyme, and one of parsley. Let it boil five minutes, put it by till wanted, and strain it before serving.

PLAIN PUDDINGS.—Bread-crumbs put into a pie-dish with alternate layers of stewed apples and a little sugar, when baked makes an excellent pudding, the juice of the apples making the bread-crumbs quite moist.

COLD MEAT AND HAM CROQUETS.—Take cold fowl or cold meat of any kind, with a few slices of cold ham, fat and lean, chop together until very fine, add half as much stale bread grated, salt pepper, grated nutmeg, a teaspoonful of made mustard, one tablespoonful of ketchup, a small lump of butter. Knead all well together, make into small flat cakes (the yolk of an egg can be used to bind the ingredients, but it is not necessary). Brush with the yolk of a beaten egg on both sides, cover thickly with grated bread-crumbs, fry in a little lard or butter to a light brown. It is surprising how many of these croquets can be made from a very little cold meat and ham, and they are excellent.

BAKED POTATOES.—Potatoes are more nutritious baked than they are in any other manner, and they relish better with those who have not been accustomed to eat them without seasoning. Wash them clean, but do not soak them. Bake them as quickly as possible, without burning in the least. As soon as they are done, press each potatoe in a cloth, so as to crack the skin, and allow the steam to escape. If this is omitted, the best potatoes will not be mealy. They should be brought immediately to table.

CORN-FLOUR PUDDING.—Boil one quart of milk, then beat the yolks of four eggs with four table-spoonfuls of corn-flour and a little milk; stir into the boiling milk, let it boil up once, and turn into a pudding-dish; then beat the whites of the egg to a froth, and add four spoonfuls of white powdered sugar; cover the pudding with the mixture, and set it in the oven and brown lightly; flavour with vannila, lemon, &c. The frosting is improved by adding a flavour to it.

IMPERIAL RICE.—Boil three table-spoonfuls of rice, picked and washed clean, in a pint of milk, with sugar to taste, and a piece of vanilla; when quite done, put it into a basin to get cold. Make a custard with a gill of milk and the yolks of four eggs; when cold, mix it with the rice. Beat up into a froth a gill of cream with some sugar and a pinch of isinglass dissolved in a little water: mix this very lightly with the rice and custard, fill a mould with the mixture, and set it on ice. When moderately iced turn it out, and serve with any jam, sauce, or fruit round it, such as strawberries.

COLLEGE PUDDINGS.—Take 8 oz bread-crumbs, 8 oz currants, 1 oz citron-peel, 1 oz orange-peel, a little sugar and nutmeg, three eggs beaten, yolks and whites separately, and a glass of brandy. Mix well, and shape them into ball; rub them over with egg, and roll them in flour. Fry a nice brown in boiling butter or lard, and drain them on blotting-paper. Or they may be put in a small moulds and baked in the oven. In either case, serve with wine or brandy-sauce.

TAPIOCA PUDDING.—Put three table-spoons of tapioca to soak over night in lukewarm water; in the morning, pour on this one quart of milk, and set it on the stove till it comes to a boil; add a pinch of salt, and four or five table-spoonfuls of white sugar, the yolks of three eggs, which, when you pour in, cools it, let it come to a boil again, or until it thickens, stirring all the time; then pour it in your pudding-dish; then beat the whites of the three eggs to a froth, add four table spoons of powdered sugar, and spread over the top; put it in the oven, and bake a light brown.

THE LEAVES OF GERANIUMS are excellent for cuts where the skin is rubbed off, and other wounds of the same kind. One or two leaves must be bruised and applied to the part, and the wound will be cicatrized in a short time.

A GOOD lip-salve, useful for chaps, etc., is made of equal parts of almond or olive oil, and the best white wax; melt the latter in a clean gallipot, set at the side of the fire, then add the oil.

GUM ARABIC STARCH.—Take 2 oz fine white gum arabic, and pound it to powder. Next put it into a pitcher, and pour on it a pint or more of boiling water, according to the strength you desire; cover it, and let it set all night. In the morning, pour it carefully from the dregs into a clean bottle; cork it, and keep it for use. A table-spoonful of gum-water, stirred into a pint of starch made in the usual manner, will give lawns. white or printed, a look of newness to which nothing else will restore them after washing. It is also good, much diluted, for thin white muslin.

CLEANING BRASS.—Brass ornaments may be cleaned by washing with roche alum boiled to a strong ley, in the proportion of an ounce to a pint. When dry, it must be rubbed with fine tripoli.

OATMEAL IN THE HOUSEHOLD.—In Great Britain, children of all ranks are raised on an oatmeal diet alone, because it causes them to grow strong and heathful, and no better food can possibly be found for them. It is also quiet as desirable for the student as for the labourer, and for the delicate lady as for the hard-working sister; indeed, all classes would be greatly benefited by its use, and dyspepsia, with all its manifold annoyances, can be kept at a distance. Oatmeal is more substantial food, it is said, than veal, pork or lamb, and quiet equal to beef or mutton, giving as much or more mental vigor, while its great usefulness consists in one's not becoming weary of it, for it is as welcome for breakfast or tea, as is wheat or Graham bread. It can be eaten with syrup and butter as hasty pudding, or with cream and sugar, like rice. It is especially good for young mothers, upon whose nervous force too great a demand has been made, and they lose the equilibrium of the system, aud become depressed and dispirited. Oatmeal requires to be cooked slowly and the water should be boiling hot when it is stirred in.—*Baldwin's Monthly.*

HOW TO COOK AN OMELET IN A HAT.—Inform your company that you are about to cook an omelet. You then borrow the best looking hat you can see among the audience, and while bringing it to the table, slip in, unperceived, a round tin dish, with a bottom exactly in the centre, the under part of which as it lies in the hat contains pancakes, and the upper part is intended to receive the mixture of flour, eggs,&c., which you have mixed up in a jar, and pour it into the hat, or rather into the tin dish, and while pretending to empty the jar, it is placed in the hat, and pressing its mouth over the sides of the tin dish, it lifts it out, batter and all, leaving only the pancakes.

THE MAGIC THREAD.—Soak a piece of thread in a solution of salt or alum, and affix to it a light wedding ring. Apply it to the flame of a candle, and burn it to ash, and it will, nevertheless, continue to support the ring.

MAGIC BREATH.—Put some limewater into a tumbler, and breath into it through a small glass tube. The fluid, which before was perfectly limpid, will gradually become white as milk. If allowed to remain at rest for a short time, real chalk will be deposited at the bottom of the tumbler.

TO CHANGE A BLUE LIQUID INTO A GREEN.—Pour a little of the infusion of violets into a wine glass, and add to it a few drops of a solution of potass or soda, and it will be changed into a beautiful green.

A NEW use for potatoes is mentiond in the *American Chemist.* By treating mashed potatoes with acidulated water containing 8 per cent. sulphuric acid, and pressing and drying the material obtained, artificial meerschaum is now obtained having great elasticity, whiteness, hardness, and capable of being carved.

HOW TO MAKE AN EGG DANCE.—Boil an egg hard, and break off a little piece of the shell at either end; then thrust in it a quill filled with quicksilver, and seal at each end. As long an the egg is warm it will continue to dance.

A CHEAP and useful substitute for india-rubber is prepared by mixing a thick solution of glue with tungstate of soda and hydrochloric acid. A compound of tungstic acid and glue is precipitated which, at a temperature of 86 deg. to 104 deg. Fah., is sufficiently elastic to admit of being drawn out into very thin sheets. On cooling, this mass becomes solid and brittle, but, upon being heated again, soft and plastic.

# Come Where Violets Grow.

Words by L. M. T. Music by W. G. Eaton.

*Tempo di Valse.*

*f* *p*

Come where vió - lets grow, love, Come where wa - ters stray;
Come, and I will tell thee, What thy heart will cheer;

Come with me and wander, All the live - long
How for years I've lov'd thee, With a love sin -

day. Leave the bu - sy murmur, Of the
cere. Come where vio - lets grow, love! Lis - ten

thought - less throng Mu - sic o'er us sound - ing, In the
to my strain; and, with sweet voice tell me, I've not

sweet bird's song.
loved in vain.

*8va.* *f* *Fine. D.C.*